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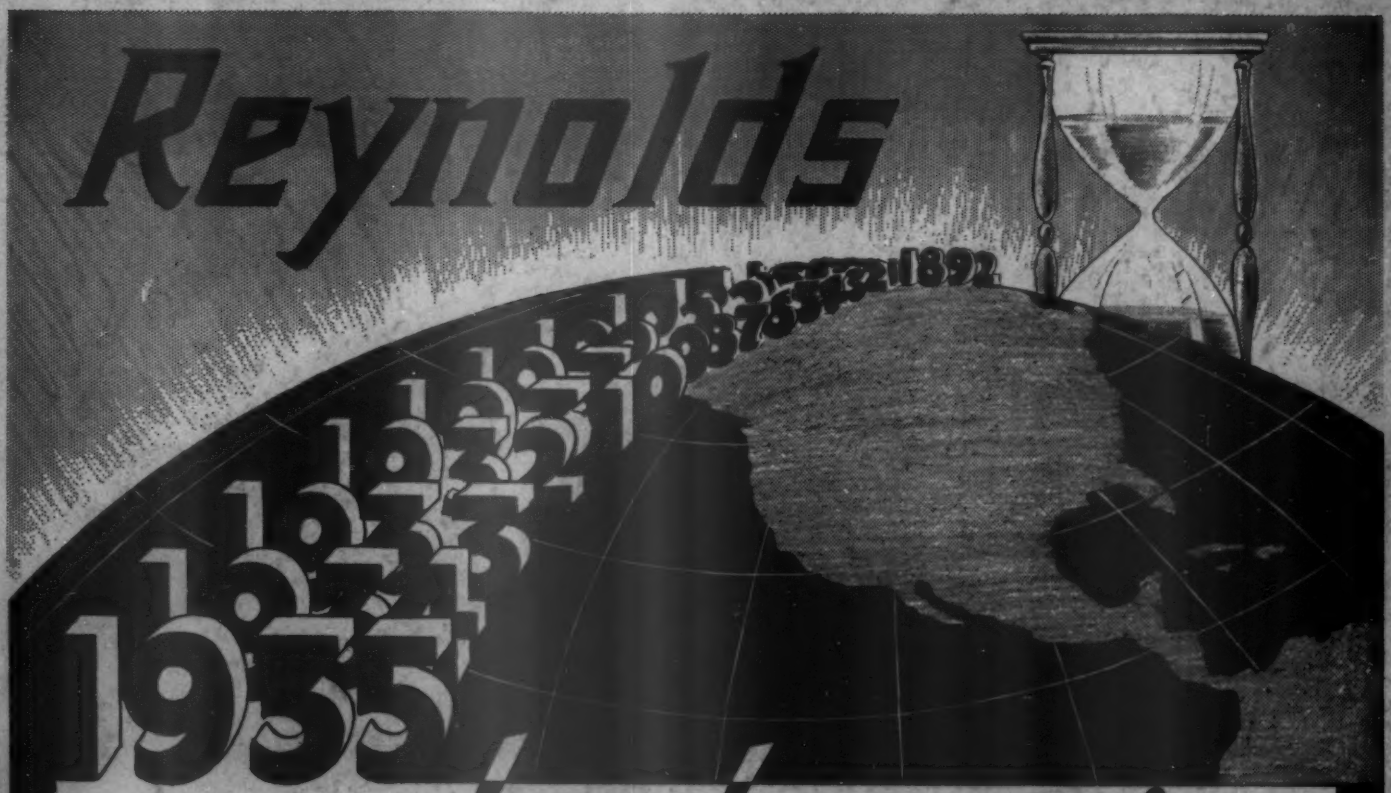

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AMERICAN GAS JOURNAL

Established 1859

FEBRUARY 1935

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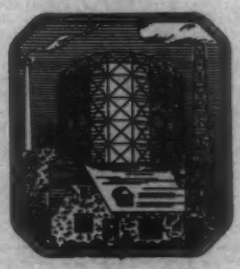

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AS THE EDITOR SEES IT

The "Washington Plan"

SELDOM has any proposal to revise the method of rate regulation attracted such widespread publicity and interest as that of the electric companies operating in New York City to adopt the so-called "Washington Plan." Operating under this plan for the past ten years, the Potomac Electric Power Company, serving Washington, D. C., and its environs, has increased substantially the use of electricity for residential and commercial purposes, has increased its dividends, earnings, surplus and reserves, has reduced its residential rates from 10c per KWH to 3.9c per KWH. Furthermore, and of vital importance, it has largely succeeded in keeping out of politics and rate cases. The plan has worked well for both company and customers. There is little wonder that it is of interest to utilities and regulatory officials.

As explained elsewhere in this issue, the "Washington Plan" is merely a modernized form of the sliding scale method of rate regulation. Basically, it is not new. The sliding scale dates from the Sheffield (England) Gas Act of 1855, and it is the usual method of regulating gas rates in Great Britain today. It has been changed from time to time to meet new conditions, but in detail only. It is not an innovation, even in this country, and its strength and weaknesses are known.

The sliding scale contemplates an automatic division of profits in excess of a certain amount between company and customers, the company stockholders receiving their share in the form of increased dividends and the customers obtaining their share in the form of lower rates. The intention is to keep the company out of rate cases, allow it to devote itself to constructive work, give it tangible incentive to operate with superior efficiency and secure low rates for the customers.

In its original form the sliding scale had two serious defects: (1) It was not adapted to fluctuating price conditions, and (2) it virtually prevented the adoption of promotional rate forms. In both the "Washington Plan" and the modern English plan these defects have largely been remedied.

Under present conditions should the "Washington Plan" or, in fact, any modern type of sliding scale be adopted by gas companies? We think it depends largely on local conditions. The success of the plan in Washington has in our opinion been mostly due to local conditions which the company would have taken advantage of in any case. However, the plan does seem to keep a company out of politics and rate cases. With increases in prices probable in the future it might yield no excess over the basic rate of return, but the assurance of that is worthy of consideration. Finally it should be remembered that the British theory of rate regulation is quite different from our own and far more conducive to the successful operation of the sliding scale.

This plan deserves the prompt and thoughtful consideration of gas executives with a view to determining whether or not it is adapted to their particular situation.

The Engineer's Place Today

SOME time ago Mr. Erick Larson, who needs no introduction to our readers, kindly offered to write a series of articles on "Gas Controls" for publication in the Journal; and we arranged for the appearance of the first installment in this issue. Thereafter we received a copy of Mr. Larson's paper on "The Engineer's Place in Today's Picture," read before the recent meeting of the Operating Division of the New England Gas Association. This paper appealed to us as being so timely and valuable that we have departed from our time-honored custom and, in this issue, have made use of two items by the same author.

Under conditions as they have developed during the past few years, the gas engineer has come to be almost a "forgotten man." Construction to handle increased business has generally not been necessary, and few companies have been willing or able to spend money for new developments in their plants. Thus it behooves every gas engineer to adjust himself to the times and find a place where his services are not only needed but desired. There is such a place in the engineering branch of new business development.

We commend both Mr. Larson's paper and his article to the thoughtful consideration of every gas engineer.

Bureau of Standards Circular No. 405

CIRCULAR No. 405, entitled "Standards for Gas Service," and published by the National Bureau of Standards, has recently come to our desk and we have given it careful study. This supersedes Circular No. 32 which has been known and used by gas companies and utility commissions for many years.

The new circular follows the general outline of the old one, (1) an introduction explaining the meaning of service standards, (2) a detailed discussion of heating value, composition, pressure, purity, meter accuracy, extension of mains and installation of service pipes, etc., (3) a schedule of proposed commission regulations, (4) a summary of various state rules for service and (5) various statistical data.

The summary of commission rules and certain of the statistics will be welcomed by gas companies and regulatory authorities. On these the Bureau has done a good job. With the balance of the circular, however, we can only express our keen disappointment. Were it not for the respect and influence that publications and recommendations of an outstanding branch of our government, such as the Bureau of Standards, do and should command, and were it not for the widespread acceptance and sound guidance of a majority of the recommendations in its predecessor, Circular 32, we should expect that this new publication would promptly sink into a well deserved oblivion. Because of its background, however, and of its evident purpose to influence future service rules, we feel constrained to put ourselves on record with our readers.

We hold it as fundamental that service rules should be simple, practical, reasonable, easily administered, readily

understood by customers as well as experts, in accordance with the law, and not more restrictive than necessary to insure good service, since unnecessary requirements only serve to increase costs of operation and lead to higher rates to the public. Generally and specifically Circular No. 405 appears to us to violate many and perhaps all of these principles.

Furthermore, the Circular goes far beyond what we understand to be the proper scope of the agency from which it comes. In the words of the Bureau itself, "its work includes such researches as are involved in the establishment and maintenance of the various standards and units of measurement, the development of measuring instruments and methods of measurement, the determination of physical constants and the properties of materials." No where do we find any propriety for its dealing with such matters as rates or property rights. Yet in this Circular it has entered these fields, and in our opinion has done a pretty mediocre job.

We might mention specifically a few of the matters on which we believe the Bureau has gone far astray.

The suggested rule for the periodic testing of meters in our opinion, is complicated, is based on hypothesis and theory rather than on practical experience with the length of time a meter will remain satisfactorily accurate, and would place an unreasonable and uneconomic burden on every gas company subjected to its requirements. Present state-wide requirements of periodic meter tests may not be ideal, but they are at least simple and workable. Our own practical experience with normal, abnormally good and abnormally bad situations leads us to the firm conviction that a substantial difference exists in the time meters may be allowed to remain in service without test in different situations. We should prefer to see the time between periodic tests recommended by each individual company for its territory and approved by the commission after proper investigation. However, the present practice, of a state-wide specified period between tests seems to us far better, as having a basis at least of fact and experience, than that suggested by the Bureau, based on general tables of meter errors and theoretical computations which few ordinary humans are likely to understand.

This same complex theory is carried forward into meter testing at the request of the customer. Sufficient to say that no customer would ever understand why he was or was not required to make a deposit for such a test. A clear cut understandable rule is essential in dealing with the public, and theoretical correctness, which we do not find in this case, may wisely be modified in many instances in order to make things simple and easy for the public to comprehend. Nor do we consider that the amount of the fee required, its ultimate disposition, except in the case of meters fast by 2% or more, or the length of time meters may be presumed to have been fast is in accord with justice or the usual established practice of utility commissions. These are in fact matters of public policy rather than standards for service.

In the matter of heating value standards the Bureau seems to us to have gone far beyond its proper sphere. Had it merely said that modern appliances can be adjusted to operate satisfactorily and efficiently within the range of heating values normally supplied, that the standards should not necessitate the production of more than a small amount of condensible products, that generally speaking the usefulness of gas is proportional to its heating value, that each company should therefore recommend and the commission approve the most economical heating value for that situation, that the variation from the standard should not exceed a certain per cent, and said no more, then we should have felt that it had done well. Instead, it has gone further. In effect it has proposed the general adoption of a thermal basis of charging, and has discussed how rates should and should not be changed. Rate making or even rate study is not a function of the Bureau according to our rather definite understanding; and state commissions will hardly welcome pronouncements from a government agency on a subject about which we believe they themselves are far better qualified to speak and to establish policies in accord with local conditions.

Again, we might ask on what basis does the Bureau set itself up as an authority, on main extensions, on the ownership of and responsibility for service pipes on the customers premises and on the territory covered by the franchises of a company? These are essentially questions of business judgment; public policy and law. The provisions as to main extensions are theoretical, complicated and might well force free extensions to customers whose use of gas would unquestionably be small, while at the same time preventing such extensions to large and profitable users. Conditions and laws differ widely in different territories, and the fact that the Bureau has found variations in the amount of main that will be run free, or the basis for doing so is no proof that commissions have failed to give this matter due attention. If a provision on extension of mains and service pipes was desired in order to round out its set of rules, the Bureau would have done well to include that contained in the last edition of Circular 32, viz. that each utility should adopt proper rules covering these matters, such rules to be approved by the commission.

To any man who is familiar with high pressure distribution the suggested general provision that the service pipe shall be "in no case less than the size of standard 1¼-inch iron pipe" needs no comment.

Much as we admire the splendid scientific work of the Bureau of Standards, in which we specifically include such outstanding contributions of its Gas Section as those on the design of atmospheric burners and the safety of gas appliances, we cannot feel that in this Circular it has done itself justice. It seems to us that it is entirely out of step with the spirit of the gas industry. Good service and good public relations are intangible assets in which the industry takes the utmost pride. Even if it did not, the bitter competition of the present day with electricity and other fuels would oblige it to give good service for self preservation. If the Circular were really helpful in showing the industry how to render its service better and more economically, then we firmly believe no commission regulations would be required to make its suggestions effective. Under present day conditions it is our opinion that the most effective regulation will be obtained through the establishment by commissions of fundamental guiding principles and then requiring each individual utility to establish, subject to its approval, a sufficient number of rules to prevent discrimination and to insure good service and public relations in the light of its local conditions.

Circular 405 gives us the impression that the Bureau believes the gas industry should be bound down by the most stringent and adverse regulations, whereas in fact it needs today the utmost freedom to meet competition and expand its business. Even where past performance has been better than permissible limits, as in the case of total sulphur, the proposed requirement has been made more stringent. The time honored and admittedly satisfactory limit of 30 grains of total sulphur per 100 cubic feet of gas has been reduced to 20 grains merely because "the total quantity of sulphur in commercial gas supplies rarely exceeds 20 grains of sulphur per 100 cu. ft."

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AMERICAN GAS JOURNAL
February
1935

The Washington Plan

A Modified Form of Sliding Scale Rate Regulation

By Alfred I. Phillips
CONSULTING ENGINEER

DURING the last week of December, 1934, the electric utilities controlled by the Consolidated Gas Company of New York, and operating in New York City and Westchester County, offered to put into effect the "Washington Plan" of rate regulation. The proposal thereafter received wide publicity, and at the time this is written is still being actively considered by the utilities and the authorities.

No definite proposal has yet been made that the "Washington Plan" be applied to a gas company,—at least none has come to our attention. But the basic principles of rate making for gas and electric utilities are the same; and what is applicable to the one class is generally applicable to the other also. The matter is thus one of substantial interest to every gas company executive and rate engineer.

The "Washington Plan" is a modification of the method of rate regulation in common use throughout Great Britain. In this country it is frequently spoken of as the "London Sliding Scale," although it is by no means confined to London nor did the basic plan even originate in London.

The sliding scale contemplates an automatic division of profits between the company and its customers on a predetermined basis. The customers receive their share through decreased rates; the company receives its share through increased dividends.

Under the sliding scale plan as generally in use in Great Britain before 1920, there was fixed for each place a "standard price" and a "standard dividend." The standard dividend was in many respects comparable to the fair rate of return with which we are so familiar; and the standard price was the rate which was intended to yield enough to pay the standard dividend under reasonably efficient operation. As long as the standard price remained in effect the company was not permitted to pay more than the standard rate of dividend. If, however, earnings were more than sufficient to pay the standard rate of dividend, then the company might reduce the price of gas and thereafter increase its dividend rate by a predetermined amount, this depending on the extent to which the price of gas had been reduced. Conversely the price of gas might be increased provided the dividend rate was reduced. In short there was a definite permissible dividend rate for each price of gas, and the lower the price of gas the higher the dividend that might be paid. It was natural and intended that the companies should have adjusted the price of gas so as to yield the largest returns to their stockholders. That meant at the same time that the customers were obtaining gas at the lowest possible price consistent with that rate of dividend. In effect, the plan amounted to a division of profits above a given amount between the stockholders of the company and the customers.

When first put into effect in Great Britain it was usual for the customers' share of increased profits through price reductions to be about equal to the stockholders' share through increased dividends; but as business grew, and the ratio of investment to sales decreased, the proportion going to the customers increased very substantially in most places. Nevertheless for many years the gas companies in Great Britain appeared to find the sliding scale satisfactory. It kept them pretty well out of politics and rate cases. However, the plan was particularly adapted to stable price conditions and to an exceedingly simple rate structure. Increasing competition, broader fields of use and changing price levels have made that evident. In England changes have been made in the sliding scale with the particular object of protecting against price fluctuations in the future, and these incidentally appear to have opened the way for the adoption of promotional rate forms.

Likewise under the "Washington Plan" the company has done much to protect itself against possible increase in costs due to changing price conditions, and has definitely avoided any standard price provision which might be a hindrance in establishing promotional rates. Instead of a standard price and a standard dividend rate, a valuation and a rate of return are fixed, and reductions in price are definitely specified and made mandatory where earnings exceed that rate. A portion of the excess earnings are thus returned to the customers.

Undoubtedly the best person to describe the "Washington Plan" is one who has had direct personal contact with it. With the kind permission of "National Municipal Review" we

reprint a substantial part of an article by William A. Roberts, Esq., Peoples Counsel, District of Columbia.*

"At a recent meeting of the American Society of Municipal Engineers, held jointly with the International Association of Public Works Officials and the New York State Association of City and Village Engineers, in Rochester, New York, there was presented a paper on regulatory principles and at its conclusion I briefly outlined a device for fixing the rates for electric current which has been in use in the District of Columbia for the last ten years. The keen interest in this device shown by the experienced city engineers present, led to the preparation of this treatise.

"I am referring to the sliding scale method, so-called, of regulating the rates for electric current in Washington. In pointing out the apparent success of this device, it is imperative that attention be directed to the peculiar conditions existing in the District of Columbia so that due caution may be exercised in deciding upon its application elsewhere. Bear in mind that Washington is a residential city, with approximately 500,000 population; that because of the nature of employment in government offices and in affiliated institutions there is a rather high proportion of apartment house residences and a compact development of individual dwellings. Beyond the limits of the city, in Maryland and Virginia, there is a more scattered suburban development. All the operations of the Potomac Electric Power Company, the producing utility, in Maryland within a radius of twenty miles of the District of Columbia, are regulated by common consent of the respective authorities under the District of Columbia arrangement.

"Stated simply, this arrangement consists of a written agreement authorized by the public utilities act of the District of Columbia between the utility and the public utilities commission. It became effective on January 1, 1925, at the termination of protracted and expensive litigation over rates. An agreed rate base was then established, and under the arrangement it was provided that each year there should be a reconciliation and that the existing aggregate receipts from sale of current should be diminished for the ensuing year by the application of rates calculated to produce less return on the same consumption by one-half of the excess above 7½ per cent earned on the rate base agreed upon. In subsequent years the rate base was to be increased by the weighted average of the net additions and betterments.

"At the same time a sliding scale of depreciation rates was devised under which, regardless of all other factors, a depreciation reserve was accrued at the rate of 2.3 per cent of the existing rate base until 15 per cent reserve was reached. Thereafter the accruals would become progressively less until 20 per cent was reached in the reserve, whereupon all accruals for depreciation would terminate until the reserve had been depleted below 20 per cent. The scheme involved provision for the automatic increase in rates, after varying delays, whenever return dropped below 7½ per cent.

"Now let us examine the facts. In the early years of the post-war period prior to 1924, Washington was prosperous and growing rapidly. Homes and apartments were crowded, and the official consumption of electricity had not descended from its war-time peak. The domestic rate for electric current was 10 cents per k.w.h. and the average consumption per inhabitant was 26.3 per month in 1924.

"Immediately after the decree was signed, the maximum domestic and commercial rate was 7.5 cents per k.w.h. and a slight adjustment of the schedules toward a promotional rate basis was made. The increase in consumption started immediately and progressed with accelerated rapidity with each rate reduction under the sliding scale. The initial rate base in the agreement was $32,500,000, including property located in nearby Maryland. By 1933 it was approximately $60,000,000, and a huge new powered fuel steam plant was put into production. A 90-mile high tension line had been hooked up to hydro-electric sources at Safe Harbor, Maryland, and production costs per unit were being hammered ever lower.

"At no time during the entire period had the owners of the plant earned less than 10 per cent net after taxes and full depreciation on the rate base which was admittedly in excess of the dollar investment in the plant. Indeed certain accounting adjustments, by no means radical, would in some years have increased the earnings to 12 or 13 per cent. With a conservative management it is no wonder the few outstanding shares of common stock rocketed to fantastic figures. The North American Company, the principal stockholder was well satisfied, and when the commission suggested that perhaps the first attempt at a sliding scale slid a little too much toward the company, the order of the commission was appealed, but the reduction was sustained with unimportant modifications by the District of Columbia Supreme Court.

"A further appeal was terminated by an acceptance of the new ratios by the company and the substitution in the formula of the following percentages:

> (4) If the rates hereafter yield more than 7 per cent in any 12-month period, on the rate base for that period, determined as aforesaid, the excess over and above the said 7 per cent shall be used in a reduction of rates to be charged the public for electric service thereafter as follows:
>
> If the amount earned is above seven per cent (7%) and less than eight per cent (8%) of the rate base, rates for the following 12 months based upon the business done during the 12 months in which such excess occurred shall be adjusted so that the gross receipts of the company shall be reduced by one half (½) of such excess; if the amount of the return is in excess of eight per cent (8%) and less than 9 per cent (9%), an additional amount of three-fourths (¾) of the said excess above 8 per cent (8%) shall be used for the reduction of rates; if the amount earned is in excess of nine per cent (9%) a further additional amount of five-sixths (5/6) of the excess above nine per cent (9%) shall be used in like manner for the reduction of rates.

(Note.—A further revision of the basis of dividing earnings has been made, and is mentioned hereafter.)

"At the present time the rate for domestic current is 3.9 cents per k.w.h. for the first 50 k.w.h., with a minimum bill of 75 cents per month, the next 50 k.w.h. costs 3.3 cents per unit, the next 100, 2.0 cents and thereafter, 1.5 cents.

"The most commonly used commercial schedule, small stores, etc., run 3.8 cents for the first 100 k.w.h., 3.4 cents for the next 150, and 2.9 for the next 3,300 k.w.h.; all over 3.550 k.w.h., 2.0 cents.

"The energy rate for street lighting is difficult to state because of other service and materials supplied,

* Effective Rate Regulation Through Sliding Scale Agreements. William A. Roberts, People's Counsel, District of Columbia. National Municipal Review, November, 1934.

but is approximately .75 cents per k.w.h. The average monthly consumption per *inhabitant* was 67.1 k.w.h. in 1932, and the domestic current sold in the same year was 67 k.w.h. monthly per domestic customer. These averages are being exceeded materially at present.

"No sensational appliance promotion program has been conducted. In fact the company recently turned its entire appliance business over to the local dealers—but that is another story."

As of February 8, 1933, the above plan was further modified and now operates as follows: Of the earnings in excess of 7% and up to 8¼%, fifty per cent is returned to the customers during the following year through lower rates. Of any earnings in excess of 8¼% and up to 9%, sixty per cent is returned to the customers. Of any earnings in excess of 9%, seventy-five per cent is returned to the customers. Thus, if in some year the company should be fortunate enough to earn 10%, i.e., 3% in excess of the base rate of 7%, a rate reduction calculated to return 1.825% to the customers during the following year would be made; and the company would in effect retain 1.175%.

If during any 24 months period earnings shall fall below 6¾%, or during any 12 months period below 6½%, then rates are to be increased by an amount estimated to bring the return back to 7%.

It is of interest to note that the Commission has not surrendered jurisdiction. It administers the plan and fixes the new rates in accordance with it after a public hearing.

Prior to the adoption of this plan the rates of the Potomac Electric Power Company were 10c per k.w.h. for the first 120 kilowatt hours and 5c per k.w.h. for the excess.

Since the plan went into effect the number of customers, sales per customer and rates have been as follows:

Year	Number of Residential Customers	Average K.w.h. per Customer	Revenue per Customer	Average Revenue Cents per K.w.h.	Maximum Residential Rate, cents per K.w.h.
1925	—	—	—	—	7.5 c
1926	82,884	456	$30.68	6.7c	7.0
1927	94,181	489	29.70	6.1	6.25
1928	103,597	524	30.12	5.8	5.9
1929	112,229	578	29.93	5.2	5.2
1930	120,829	636	29.78	4.7	4.7
1931	127,878	714	29.78	4.2	4.2
1932	132,733	798	30.30	3.8	3.9
1933	133,467	868	31.69	3.7	3.9 *

It should be kept clearly in mind that the Washington situation is quite unusual, and that local conditions have probably been at least partly responsible for the results. It is therefore well to look further and see what has been the past history of the sliding scale system of rate regulation.

The earliest practical application of the sliding scale principle that we can find was in the Sheffield (England) Gas Act of 1855. Eleven years later, in 1866, this same company procured from Parliament an additional Act which recited that the sliding scale of 1855 had worked well. By 1873 seven other companies had adopted similar provisions for the regulation of their rates and dividends.

In London the adoption of the sliding scale was urged by the consumers' association as early as 1858, but it was not until 1875 and 1876 that the various Metropolitan Companies accepted the plan.

By 1913 companies selling about 75 per cent of the gas in Great Britain operated under the sliding scale.

In 1912 there were 17 sliding scale and 37 maximum dividend companies which were selling between 100 and 500 million cubic feet of gas per year and were operating on the same rate system as in 1880. Similarly there were 14 sliding scale and 13 maximum dividend companies selling over 500 million cubic feet per year and had been on the same rate system since 1880. The reduction in the price of gas for each group was as follows:

REDUCTION IN PRICE OF GAS, 1880-1912†

	Sliding Scale Companies	Max. Dividend Companies
100 MM to 500 MM per year	16.4d.—34.7%	11.8d.—26.1%
Over 500 MM per year	14.0d.—33.5%	9.3d.—26.5%

From this it may be inferred that the sliding scale had lent strong incentive to economical operation, and that it had proved beneficial to both customers and stockholders.

The period above referred to was one of relatively stable prices; but with the outbreak of the war the situation changed. Conditions beyond the control of the companies caused a rapid increase in costs. It was necessary to raise rates and reduce or eliminate dividends. The authorities adopted various temporary measures to relieve the situation; but the weakness of the sliding scale under such circumstances became apparent.

In the historic South Metropolitan Gas Act, 1920, under which the therm method of charging was first established by law, the sliding scale was also altered so as to insure a fair return to the company in the event of adverse general conditions, and also at the same time appears to have given greater freedom in the adoption of promotional rate forms. The price provisions of the Act are as follows:

"The basic price of gas supplies under the powers of this Act shall be eleven pence for each standard unit‡ and that price is in this Act referred to as 'the basic price.'

"The Company may subject to and in accordance with the provisions of this Act increase or reduce the price charged by them above or below the basic price but except as by this Act otherwise provided the Company shall not in any one year declare any larger dividends on the ordinary stock of the Company than a dividend at the rate of five pounds in respect of every one hundred pounds of the said stock issued before the passing of this Act and for the time being paid up and a dividend at the rate of six pounds in respect of every one hundred pounds of the said stock issued after the passing of this Act and for the time being paid up and the said rates of dividend are in this Act referred to as 'the authorized rates.'

"Whereas it was expedient that the surplus profits of the Company should in the future be divided in the following proportions namely three-fourths to the consumers and one-fourth equally between the ordinary stockholders and the employee co-partners of the Company the following provisions shall apply (that is to say):—

"(1) At the end of each year or half-year a sum shall be calculated representing the amount by which the total amount payable by consumers during such year or half-year has been less than the amount which would have been payable if the gas had been charged for at the basic prices and such sum so calculated shall be called 'the con-

(Continued on page 56)

* Lower rates for use in excess of 50 K.w.h. Minimum charge, $.75 per month, 1925-1933 inclusive.

† "The Public Regulation of Gas Companies in Great Britain and Ireland," by Nathan Matthews.

‡ Elsewhere the Act provides: "The standard unit shall be one hundred thousand British thermal units." Thus the standard unit is one therm, but this word had not come into use when the Act was drawn.

Gas Pressure Controls

Theory of Pressure Regulation, General Requirements, Design and Operation

By

ERICK LARSON

GAS ENGINEER

Definition and Theory

GAS controls are mechanical, automatic, self-contained devices designed to change and regulate the pressure or the flow of gas within predetermined limits. The moving parts are ordinarily actuated by either gas flow, pressure or electricity; any one of which may be indirectly time controlled.

Controls for high pressure systems usually take the form of line regulators which are designed to provide methods of balancing forces whereby one force is selected to be maintained at an approximately uniform value and is used as the actuating medium of the regulator mechanism either directly or indirectly. The idea of balanced forces is fundamental in the control of gas.

Regulators provide variable restrictions to the gas flow in the gas system. In high pressure regulators the most common method of control is to have a flexible diaphragm which will respond to changes in the controlled pressure. Since the gas pressure on the diaphragm is in one direction a counter-balancing or reactionary force is provided by weights, springs or gas pressure. As the particular point in space where the above forces will balance each other varies with changes in the controlled pressure or flow, the movement occurring during the process of balancing or stabilizing is used as the actuating force to vary the restriction placed in the gas flow which is usually the valve of a line regulator.

The results produced by the use of automatic equipment may be duplicated by hand controlled shut off valves, needle valve, variable orifices or decreasing the pipe diameter at the control location. Any of these methods would require constant attendance on the part of an operator particularly if there was frequent fluctuation in inlet or outlet pressures and therefore, would be uneconomical. Mechanical controls will function when provided with some source of power such as the movement of a diaphragm without the aid of constant physical assistance on the part of an operator.

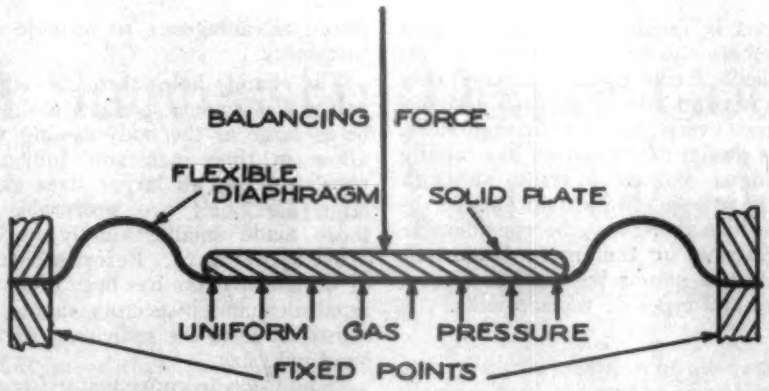
While the controls will function mechanically it is desirable that the control will be produced automatically within practical limits so that operating attendance may be entirely eliminated, thus providing a maximum of operating economy and maintenance, also excellent quality of regulation.

Controls are self-contained in that they do not depend upon the operation of other types of distribution apparatus for their proper functioning and except for electrical controls do not depend upon foreign sources of power for their operation. The term control will be used as a general term to include all the apparatus required to produce automatic regulation although the several parts may be at widely separated locations. Usually all the parts are in a single structure or station and often in one single piece of apparatus. Occasionally the auxiliary equipment or mechanism actuating the restriction controlling pressure or flow may be a device located at some distant point with electrical transmission spanning the intervening space.

Mr. Erick Larson, Chairman of the A.G.A. Distribution Committee, needs no introduction to our readers. His series of articles on High Pressure Distribution and High Pressure Storage which recently appeared in the JOURNAL, have brought forth much favorable comment, and we believe are an outstanding contribution to the literature on the subject. In a new series on Gas Controls, of which this is the first installment, Mr. Larson discusses the underlying theory of presure regulation, the types of regulators with the advantages of each, points the design which make for satisfactory and economical operation, the capacities of regulators, and matters to be considered in their installation, operation and maintenance. It is a practical series of articles which should be of value to both the engineer and the man directly concerned with operation.

Purpose

Controls have a variety of purposes the most common of which is to maintain the pressure at some particular location in a distribution system at practically a constant pressure or at least within desired limits in order to secure certain advantages resulting from the maintenance of a distribution pressure lower than that of the source of supply yet sufficient to provide adequate service. Some of the purposes for reducing the distribution pressure under that of the source of supply are minimizing leakage, minimizing inlet pressure variations on house regulators and lessening the possibility of fractures or failure of gaskets or joints from excessive pressures. Regulation also provides a more uniform pressure on station meters, on high pressure consumer meters, on high pressure burners and to individual consumers served with high pressure. By the regulation of individual distribution systems compressing economy may result from the use of higher and larger varia-



Diagramatic view of the forces acting upon the diaphragm of a line regulator. The balancing force plus the weight of the solid plate and diaphragm must be equal to the total pressure caused by the gas.

tions of pressure on the transmission lines, than are desirable on distributing lines. In general the advantages of regulation are to provide service, safety and economical operation.

One of the most common reasons in gas distribution is to prevent the pressure in storage tanks or subtransmission lines from exceeding a predetermined maximum. Another design prevents the flow of gas until the pressure on the source of supply or inlet side of the regulator is above a predetermined minimum. Practically all regulators allow the flow of gas in but one direction, thus incidentally acting as a check valve. However, should the inlet pressure on direct flow regulators be below the lock-up pressure, the regulator would allow gas to flow in the reverse direction unless especially designed. Compressors or boosters lacking devices which would limit the outlet pressure within safe limits usually have a regulator placed with the inlet on the high pressure side and the outlet on the low pressure side of the compressor or booster. Should a maximum predetermined pressure be exceeded on the compressor outlet the gas would be by-passed back into the compressor inlet. A similar design may be used in preventing vacuum forming on the compressor inlet side. Instead of a vacuum it may be desirable to maintain a certain minimum pressure on the compressor inlet in which case the regulator is set for that pressure. Regulators installed across compressor or booster connections are called by-pass or safety regulators or valves as their primary function is to provide a safety feature rather than pressure control. In certain instances such as high pressure meters which because of being on the inlet to a compressor or of insufficient capacity may at times be subjected to differentials greater than desirable, regulators are installed which will limit the differential pressure across the apparatus to any predetermined amount within the limits of the regulator design. There are numerous other reasons for controls most of which have a purely local application and for which controls are especially designed by the manufacturers.

Limits of This Discussion

The great variety of purposes and designs of regulators necessitates limiting the following discussion to the practical conditions encountered when distributing gas at pressures above a pound where so-called line or pounds to pounds regulators are used and to the distribution system as a whole rather than individual consumers.

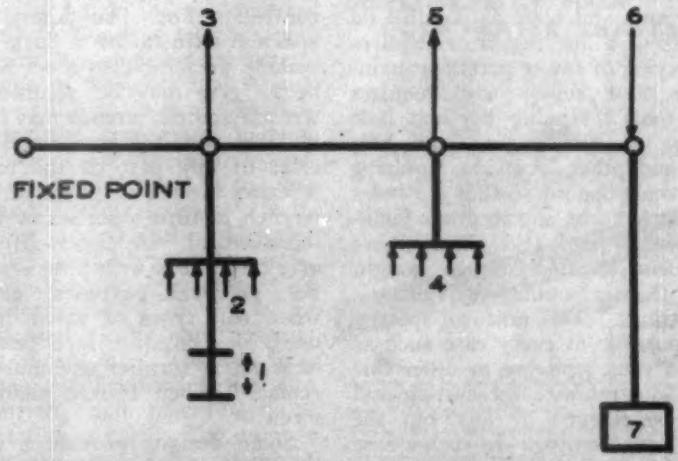
General Requirements

There are many mechanical requirements for regulators, their importance depending on local conditions. Priority of discussing is therefore immaterial as local conditions will decide the relative importance of each factor.

Practically all manufacturers have developed about an equal quality of regulation on their line regulators. The maintenance of quality regulation under operating conditions and ease of duplicating the initial quality after readjustment and repairs varies in different makes and are therefore important factors in selecting regulators. In some types it may be possible to make a complete repair in a comparatively short period but should the adjustment be unsatisfactory, readjustment would require practically a complete disassembling. While disassembling would consume time this time is not a large factor considering the infrequency of such repairs whereas maintaining continuous quality of control is of consequence.

Simplicity of Design and Operation

Simplicity is desirable when it can be secured without being detrimental to quality of control or safety. The alleged advantages of an auxiliary bowl on line regulators are mainly derived from experience with low pressure district regulators and are usually given as a more positive lock up and greater sensitivity.



Diagramatic view of the forces acting upon an auxiliary bowl line regulator. Force No. 1 balances itself being equal in both directions. Force No. 2 is a uniform upward force caused by gas pressure on the diaphragm. Force No. 3 is the resulting force from No. 2 and the weight of the apparatus. Force No. 4 is the uniform gas pressure acting on the auxiliary bowl diaphragm. Force No. 5 is the result of force No. 4 less the weight of the apparatus acting against force No. 4 on the auxiliary bowl. Force No. 6 is the balancing force resulting from weights placed at No. 7.

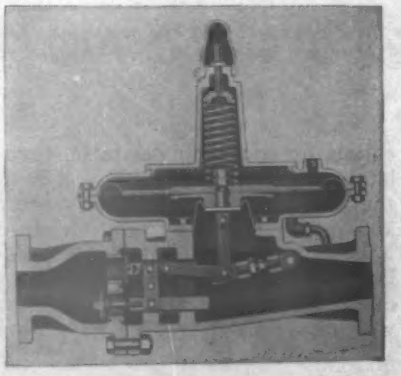
Many years of experience with single diaphragm line regulators have indicated that they possess power to provide a positive lock up and on many designs have a sensitivity in excess of that found on auxiliary bowl types.

As discussed under house governors the dead weight method of securing a balance of pressures has retained its popularity and provides added simplicity.

On the lever arm there are at least three points of suspension all of which are hinged on some designs. Simplification is acquired by having a hinge at the point that the lever arm is held rigid or at the lever arm connecting link, a point or line contact where the valve stem and lever arm meet and the weight hanger hooked into holes in the lever arm. When the lever arm is fixed at one end the movement of the point on the lever arm where the stem is attached will be in an arc. With the slight value of the stem travel the hinge movement in an arc is practically negligible particularly on regulators having soft valve discs. However, to overcome any possible harm from such movement and also overcome slight differences in the distances between the hinge at the fixed point and valve stem hinge resulting during manufacturing a short connecting link or arm is installed between the fixed point and the lever arm hinge at the fixed end. Such a link diverts from simplicity and also allows a freedom of movement of the lever arm which allows the weights to pull the arm until further movement is resisted by the valve stem guides.

Providing as few sizes and varieties of nuts and bolts as possible on all parts of a line regulator requires the carrying of fewer parts for maintenance and repair and requires fewer tools. Having the bolt hole drillings on all flanges, hand hole plates and other locations requiring bolts evenly spaced so that the holes will match up at any location facilitates repairs and also allows more convenient location of the weight hangar than is possible with unvariable settings. This uniform spacing is not possible in every case such as where a vent, pressure or other line is cast integral with the casting and would be clogged by any but the proper flange setting. In such a case it is preferable to have the diaphragm or flange gasket pre-punched to assure a clear vent line and arrange the bolt holes so that only a single setting is possible.

On all castings and where possible on other parts ordering of replacements is facilitated by having part numbers clearly cast, stamped or attached. Some manufacturers justly claim as an advantage such designation of every part of their regulators. The design of regulators has rapidly changed and as a result although many appear identical in outside dimensions there may be considerable difference in the more important parts and numbering assures correct sizes and types of replacements.



Reynolds Double Valve Toggle Regulator without auxiliary bowl for pounds to inches regulation.

Adjustment of Valves

The policy of control quality being superior to minimizing repair time is affected by the accessibility of the adjustment for providing and maintaining the proper spacing between the two valve discs, as inconvenience may lead repairmen to be satisfied with a quality of work that will not provide a satisfactory quality of control. For maintaining valve spacing adjustment a lock nut is usually preferable to a set screw as better grip may be secured for a wrench and the wrench may be manipulated with the hands and fingers clear of any part of the regulator whereas the use of pliers or a small wrench to turn a set screw is more inconvenient. A closer adjustment may be secured with a set screw, but for practical purposes, especially when soft types of valve discs are used, lock nuts are satisfactory. A lock nut is sturdier and more easily replaced when broken than a set screw.

Some designs provide a non-adjustable spacer between the two disc holders or valves and manufacturers report practically no complaints. In field practice, however, the reason for no complaints is found in repairmen filing the spacer or adding shims. With metal valves it is often found advantageous to provide adjustability.

The hand hole through which valve adjustments are made should be as large as the body casting will allow in three-inch and four-inch regulators and in larger sizes extra large handholes are preferable to those made smaller simply to improve appearances. Before a change of design or make has been accepted repairmen and inspectors should be consulted as to the sufficiency of the hand hole size.

In addition to convenience for adjusting, the location of the hand hole for observing the interior is important as the valve adjustment and condition of valve disc and orifice seat is determined by observation.

Lubrication

On regulators having parts which must be oiled or greased the means of accomplishing the lubrication are preferably external to the body of the regulator and of the pressure type. Pressure lubrication may be provided by an ordinary grease cup although this type is subject to gas leakage, especially when removed for refilling and often can not be removed without shutting off the regulator. Superior types are those which require some external force such as a grease gun to provide the pressure necessary to overcome the gas pressure and which also have a ball check valve in the attachment inserted in the regulator body to prevent gas escaping. The lubricating attachment on the regulator is generally provided with a cap placed in position between the acts of lubricating as an added precaution against gas leakage.

Pressure permitting, it is preferable to separate different pressures with a diaphragm and eliminate stuffing boxes or any other close fits which require lubrication, thus eliminating any possible binding of the valve stem or other moving parts and also to eliminate the variation in control due to changes in the friction of stuffing boxes.

Flanges

The use of through bolts rather than stud bolts on all flanges provides increased space for using wrenches and allows making up the flange joint with a higher degree of safety against leakage. Leakage with stud bolts is usually due to workmen fearing breaking of the stud which would necessitate drilling and tapping.

(Continued on page 28)

A Successful Dealer Cooperation Plan

Methods Used and Results Obtained

By Harold E. Jansen

FOR more than two and a half years a plan of dealer co-operation in the sale of appliances has been successfully carried out by properties in the Associated Gas & Electric System in Central New York. The territory is comprised of small cities in what the utility calls the Empire-New York Group. Auburn, with a population of 36,652, and Ithaca, with 20,708 inhabitants, are the largest of the six communities stressing the dealer co-operative plan. Geneva, with 16,053 population, Cortland with 15,043, Newark with 7,649, and Penn Yan with 5,329, are the other cities in the group.

During the more than 30 months that the co-operation plan has been in operation, slight changes have been made in the set-up, but its fundamentals remain the same. The utilities, including the Empire Gas & Electric Corporation, the New York State Electric & Gas Corporation, and the New York Central Electric Corporation, are stressing co-ordinated advertising, the allocation to dealers of installation of appliances sold to company employes or the general public; revision of the finance plan so that the utility would provide credit only on the same terms as that which could be offered by independent dealers; the elimination of trade-in allowances; maintenance of a price policy; the elimination of discrimination; and assisting dealer organizations with salesmen's training schools, window displays, in closing sales, and by other methods.

The co-operative plan was built around the idea of increasing the gas load on the utility's lines without actually competing with the retailers, such as hardware and department stores and plumbers, in their profit-making objectives.

Three Campaigns

During the past year three campaigns for the sale of load-building gas appliances were conducted in the territory. They included a range and automatic water heater campaign in the spring; a gas house heating campaign in the late summer and early fall; and a gas automatic water heater drive in September and early October. All of these efforts were highly successful.

All quotas set up in each community were based on load increase, and were predicated on the total potential volume of business that it was thought possible to do in the district, considering the number of meters, the number of appliances of a similar nature already in use in the territory, and general business conditions. The quotas included dealer sales as well as utility company sales.

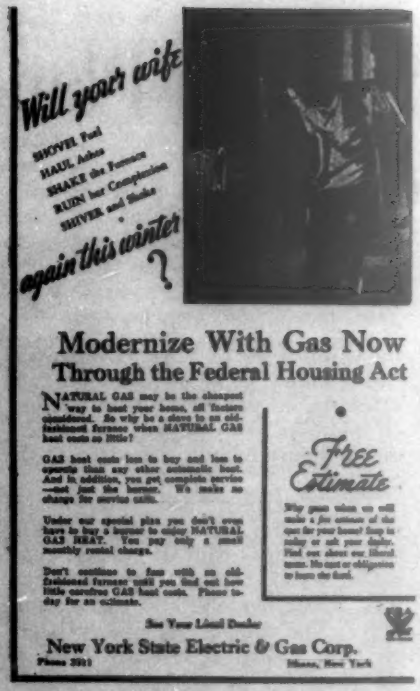
Each community is supervised by the district manager of the entire group as well as the new business manager of that city. The new business manager subdivides the city into districts, and places a sales representative in each. The number of utility salesmen and the amount of territory covered depends upon several factors, among them the number of dealers, the conditions within the territory, and the number of meters. There are approximately 24,000 domestic gas consumers in the Empire-New York Group, and the territory is so divided that each salesman covers about 3,000 meters. In addition, the company has 19 domestic house heating salesmen in the territory.

The salesmen are compensated with a salary, plus a load building bonus which is paid on ranges, automatic water heaters, gas refrigerators, space heaters, and incinerators only. The compensation is reckoned on both utility and dealer sales in the territory covered by the salesman. The bonus on the m.c.f. lead building capacity of the appliance is figured from the weekly reports turned in by the dealers to the utility.

It is the duty of the utility salesman to canvass the territory which he represents. This section of the city may also be covered at the same time by salesmen from dealers establishments. The utility company salesman canvasses in the interests of the utility only where the prospect has not been approached by dealers' representatives. If the prospect for a range or automatic water heater states that she has contacted a cer-

She REBELLED
at
COLD DISH WATER
Then he Got a Gas Storage Heater
LUGGING the washtub back and forth between range and sink; refilling her dishpan two or three times; trying to dissolve grease in lukewarm water—her patience was finally exhausted, and is it any wonder?
Then her husband got a gas storage heater. He'd have gotten one sooner if she'd known how little it really cost. Now she just turns the faucet and has all the hot water she ever wants. Dishes take half the time. And how continuous hot water service helps with other cleaning jobs!
Today's low prices and our special terms make automatic gas hot water service something every family should have. Learn how easily you can get a gas storage heater. Ask us or ANY DEALER.
FOR SHORT TIME ONLY
The Associated System and Local Dealers are offering special terms with low down payment on the purchase of
GAS RANGES and WATER HEATERS
Associated Gas & Electric System
LOCAL COMPANY NAME

He RAGED about
COLD WATER SHAVES
Then he Got a Gas Storage Heater
NO wonder he never got off on the right foot in the morning. A rough and ready shave is enough to make anyone feel funk with the razor, the coffee and the world in general.
Now he gets a good start every morning. No more cold water shaves for him. His economic GAS storage water heater keeps plenty of HOT water waiting for him. And his smiles when he thinks how little it costs...only a few cents a day.
Before you shave again learn the facts about automatic HOT water service with GAS. Just ask us or ANY DEALER.
FOR SHORT TIME ONLY
The Associated System and Local Dealers are offering special terms with low down payment on the purchase of
GAS RANGES and WATER HEATERS
Associated Gas & Electric System
LOCAL COMPANY NAME


Will your wife
SHOVEL Fuel
HAUL Ashes
SHAKE the Furnace
RUIN her Complexion
SHIVER and Shake
again this winter
?
Modernize With Gas Now
Through the Federal Housing Act
NATURAL GAS may be the cheapest way to heat your home, all factors considered. So why be a slave to an old-fashioned furnace when NATURAL GAS heat costs so little?
GAS heat costs less to buy and less to operate than any other automatic heat. And in addition, you get complete service—not just the burner. We make no charge for service calls.
Under our special plan you don't even have to buy a burner to enjoy NATURAL GAS HEAT. You pay only a small monthly rental charge.
Don't continue to fuss with an old-fashioned furnace until you find out how little carefree GAS heat costs. Phone today for an estimate.
FREE Estimate
Why guess when we will make a free estimate of the cost for your home? Step in today or ask your dealer. Find out about our liberal terms. No cost or obligation to learn the facts.
See Your Local Dealer
New York State Electric & Gas Corp.

tain store in reference to the sale, or that a dealer salesman has approached her in regard to it some time in the past, it is the signal for the utility salesman to at once notify the dealer of the prospect. If the dealer has no salesman, he will likely ask the utility salesman to attempt to close the deal for him. If he has salesmen in his employ, they are usually able to close the sale themselves, but the utility salesman stands ready to assist in any way possible.

Cooking Schools

Co-operative cooking schools and refrigeration shows may be run off during the year. Here the home service department of the utility is a great factor in the success of the effort. The dealers display their various makes and styles of merchandise, and the home service director demonstrates its use. Door prizes of groceries are given to the person holding the lucky numbers. In the sale of ranges and refrigerators in particular the prospect may express a preference to a certain make, and the utility immediately turns over the name of the prospect to the dealer who handles that line. A member of the staff home service follows up each installation of an appliance in the home, checking up to make sure that it is properly installed. She shows the housewife how to bake in the oven, and how to make frozen desserts in the refrigerator. She helps make a satisfied customer. The utility invites dealers to display their merchandise on the sales floor of the office, where the customers who come in to pay their gas and electric bills may view it. Prospects received from the floor are turned over to the dealer.

Dealers Agreement

Under the dealer co-operative plan the dealers agree (1) to merchandise load building appliances, and to stress their attention upon these items; (2) to advertise load building items, coordinating their advertising with that of the utility. The utility spends about $25,000 in promotional advertising during a year in the territory served. The advertisements do not stress the name of the appliance or its price, but rather the utility and convenience of the merchandise offered. The phrase, "Ask us or see your dealer," is used on all advertising. Progressive dealers see the advantage of tieing in their advertising with that of the utility on the same day and page of the newspaper. (3) To handle only approved appliances as to quality and design, such as those approved by the Good Housekeeping, American Gas Association, and Modern Priscilla kitchens. (4) To maintain adequate servicing facilities and to render efficient service on all appliances which they sell. (5) To report all sales and installations of load building items to the Company. (6) To attend all meetings in connection with this plan. (7) to put salesmen in the field for their organization where this is possible. (8) To hold themselves responsible for the attendance of these salesmen at regular meetings conducted by the new business manager of the district. (9) To cooperate in window displays, direct mail promotion, etc., of appliances. (10) To send representatives to merchandising schools when this is possible. (11) To cooperate in spirit and action to make the plan successful.

The Empire-New York Group has a new business manager at Geneva, N. Y., who supervises the operation of the plan in the entire territory. Each community has its new business manager, and his responsibilities are: (1) To divide the district into territories. (2) To set quotas for these territories. (3) To supervise the activities of the sales supervisors in the district. (4) To arrange regular meetings of the dealers in the district to discuss campaigns, ways of improving the plan, methods of obtaining sales, reports, and other things pertinent to the success of the plan. (5) To keep dealers informed of campaigns, special activities, advertising schedules, meetings, changes in policy, results of sales efforts, and other pertinent facts. (6) To promote co-ordinated advertising, window and floor displays of load building appliances, greater sales for all outlets, and to coordinate the activities of all outlets in the territory. (7) To maintain regular contact with all dealers in the territory in order to facilitate cooperation. (8) To plan campaigns, market analyses, and other activities which promote sales of appliances. (9) To conduct regular meetings of salesmen (dealer and utility) in order to make them more efficient. (10) To conduct schools from time to time of an educational nature in order to instruct salesmen about their appliances, how to sell, and other similar subjects. (11) To merchandise extensively through all outlets, continually seeking greater sales of load building appliances through aggressive effort. (12) To maintain reports, consolidating them in such a way as to present the results of this cooperative merchandising program. (13) To assist dealers to make necessary

N. H. A.
Now Makes It Possible
For YOU To Have
Gas House Heating
Let us explain how you can use NATIONAL HOUSING ACT funds to make improvements in your home! We will handle all the details for you . . . no need to go to a bank! Treman, King's experts will make a survey of your home and furnish free estimates on any improvements you desire to make.
Enjoy the Luxury of a
JANITROL
Gas Burner
There IS a Difference
Can be installed in your present furnace or boiler.
For Rent or For Sale at
Treman, King's
Don't Miss Our Great
90th Anniversary Sale Celebration
Now In Progress!

finance connections. (14) To supervise the dealer prospect file and to route installation and service work in an equitable manner. (15) To plan home service work and see that it functions properly. (16) To lend every effort to co-operation with dealer organizations.

Dealers are asked to file all prospects upon which they desire protection in the dealer prospect file which is maintained in the utility office. This filing protects the dealer on all prospects listed which are sold by the utility salesmen. Prospects in the file will be protected for dealers listing them over a period of 30 days. This protects the dealer from the utility company's salesmen selling the prospect for another dealer during the 30-day period. Prospect cards will be supplied dealers at all times. Dealers fill out the report of merchandise sold weekly in order to cull the prospect file continually to keep it up to date.

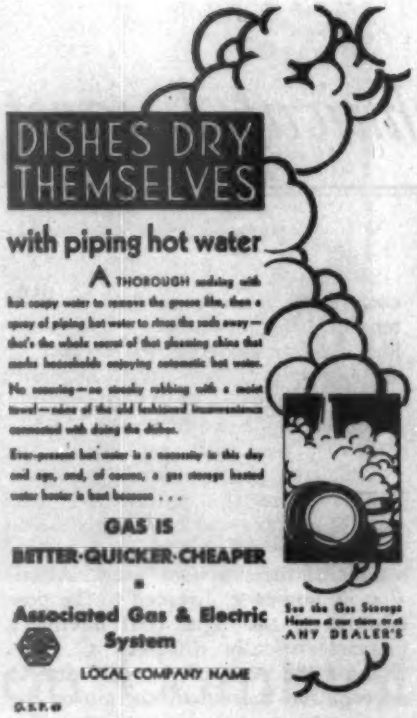
The dealer does not necessarily have to file a prospect card in order to be protected on the sale. If the utility company's salesman contacts a prospect, and that prospect says he has been contacted by a dealer, or wishes the particular brand of merchandise sold by a certain dealer, that dealer is immediately contacted.

The new business managers report that the dealers with a sales staff are the ones who are getting the most out of the utility-dealer co-operative plan. The utility recommends that each retailer have a field organization for this is the best way to assure him that he will obtain his share of the business.

No Trade-in

The utility and the dealer have adopted a policy of no-trade-in allowances. The dealers finance their own sales, the utility maintaining finance charges that are comparable to those of the finance companies. To help maintain a closer contact between the utility, the dealer, the jobber, and the manufacturer, the utility circulates a periodic bulletin to all dealers, etc., conveying information about appliances, new selling ideas, campaign plans, advertising, promotion, and subjects pertinent to the successful conduct of this cooperative program.

This writer has called on dealers in two of the six communities in the territory served by the Empire-New York group of utilities, and among the aggressive merchandisers particularly he found the heartiest good will and appreciation for the co-operative plan of the utility. The backward retailers and plumbers were not


DISHES DRY THEMSELVES
with piping hot water
A THOROUGH rubbing with hot soapy water to remove the grease film, then a spray of piping hot water to rinse the suds away—that's the whole secret of that gleaming shine that makes households enjoying automatic hot water.
No scouring—no steady rubbing with a moist towel—none of the old fashioned inconveniences connected with doing the dishes.
Ever-present hot water is a necessity in this day and age, and, of course, a gas storage heated water heater is best because . . .
GAS IS
BETTER-QUICKER-CHEAPER
Associated Gas & Electric System
LOCAL COMPANY NAME
See the Gas Storage Heater at our store or at ANY DEALER'S

in a position to reap as much advantage from the cooperative plan as those merchandisers who employed salesmen and tied in with the utility in advertising and other promotional work. The merchandisers all agreed that they had been benefitted by the plan. The only criticism that was heard was given by one dealer who complained that the utility sold appliances to its employes on a cost plus 10 per cent basis. Sales to employes declined greatly in 1934 over the preceding year, the company's statistics show, because they had nearly reached the saturation point in regard to some of the appliances. In 1934 there were 98 gas ranges sold to employes in the six communities, compared with 161 the year before.

Results

During 1934 merchandise sales by the dealers and the utility—the latter being negligible—amounted to 1427 ranges, 44 refrigerators, 344 automatic water heaters, 199 tank heaters, 60 portable space heaters, and 689 gas burning furnaces for homes. Of the 689 installations, the dealer took part in 373 installations, either selling the furnaces outright or acting as the utility's agent when the furnaces were leased. In such a case the dealer was paid a bonus, and he was given the business of installing the unit in the home. In addition, there were 96 commercial installations, of which 49 were made by the dealers. The percentage of sales of gas burning furnaces by the utility was higher because of its large and efficient sales force, and in some cases it was practically a pioneer in house-to-house canvassing.

Some idea of the aggressiveness of the merchandising activities in gas house and commercial heating may be gained by the fact that previous to that time there were only 362 gas house heating jobs and 46 commercial jobs in use in the territory. In one year these figures had been increased to 1,051 and 142, respectively.

Considering the ranges, refrigerators, automatic water heaters, tank heaters, and portable space heaters alone, the utility considers that it added 32,140 mcf to its lines by their sale by the dealers during the year. This, it is estimated, will add $10,136 in annual revenue to the company.

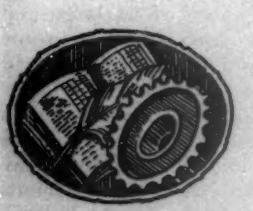
The company's executives believe that the house heating units sold in the territory will add 183,610 m.c.f. to the gas load, and bring in $136,375 to the annual revenue. The added gas load and revenue on the commercial sales is hard to estimate, because of the variance in the rates and the amount of gas used.

One factor that has contributed to the success of the dealer cooperative plan is that the salesmen have no inducement in the way of financial return for making the sale for the utility. That is, with their compensation depending only on the amount of load building appliances sold in the territory, they are just as glad to give the plumber, or hardware or department store merchant the credit for the sale as the utility. This tends to eliminate bickering and unpleasant relations. The number of utility sales is declining rapidly from year to year as the dealers build up a more powerful sales organization through the co-operative plan.

Better Shop Heating

What is probably the largest single gas-fired unit heater installation on the basis of heating capacity ever made is in the three shops of the Pittsburgh Railways Company, Pittsburgh, Pa., the machine shop, the carpenter shop and the warehouse.

The annual cost with the old coal-fired system was about $6500 with coal at $1.25 per ton. The new system functioned perfectly last season in spite of the cold weather and the cost of gas was only $5,296. In a normal season the total gas cost will probably not exceed $4,800.—AGA Industrial Gas News.



Technical Digest

FORMATION OF WATER-GAS AND BEHAVIOR OF BROWN COAL AND BITUMINOUS COAL COKES AND SEMI-COKES IN WATER GAS PRODUCTION

Previous investigations of the reactions involved in water gas production are briefly reviewed. The rate of decomposition of steam when passed over coke or semi-coke at 400-1200° has been studied in the laboratory. The steam diluted with nitrogen was passed through a column of the coke contained in an electrically heated silica or porcelain tube and the issuing gases were analyzed. The cokes were produced in a laboratory scale retort and allowed to cool in nitrogen. The reaction with steam was effected in each case at 10° below the carbonizing temperature. With bituminous coal cokes the amounts of steam decomposed and of carbon monoxide produced were considerably less than the values calculated from known equilibria at the same temperature; they were also less than the corresponding values obtained with wood charcoal. Its reactivity decreased with rising temperature of carbonization. With the brown coal cokes and semi-cokes also the gasification equilibria were not reached under the experimental conditions used. The percentage of steam decomposition increased with rising reaction temperature, with decreasing steam saturation of the nitrogen, and with decreasing gas velocity. The reactivity of semi-cokes increased with rising temperature of carbonization up to 700° and thereafter fell again. The percentage of steam decomposed increases with time of contact, at first more or less rapidly and then more slowly, without, however, attaining the equilibrium values within the times of contact used.

Comparison of the results with those of others shows that the reactivity of the materials towards steam increased in the order—graphite, soot, coke and semi-coke from bituminous coals; wood charcoal, semi-coke and coke from brown coals. The water gas equilibrium ($CO+H_2O \leftrightharpoons CO_2+H_2$) was established in the experiments with wood charcoal and bituminous coal coke at temperature above 600°. This equilibrium was also reached at 600° in an empty porcelain tube, but only with a somewhat long contact time. Boudouard's equilibrium ($C+CO_2 \leftrightharpoons 2CO$) was not reached in the gasification experiments. Representation of the results on Ostwald's gasification triangle showed the average of the Parr unit coal values of the fractions used. Attention is, however, directed to the possibility of the light coal having a characteristically different C from that of the rest of the coal due to segregation therein of certain of the pure coal components. Extrapolation to zero C gives the correct mineral matter content only when the heat of transformation of mineral matter into ash is negligible.

Results obtained with mixtures of low ash coal with pyrites, calcite or gypsum show that to obtain the correct value the intercept of the curve with the ordinate representing C of the mineral matter must be taken.

The pure coal C obtained by the graphical method will include a correct value for C of the original sulfur provided that the ratio of original sulfur to pure coal remains constant with change in ash content of the fractions. The graphical method provides no advantage over the Parr unit coal formula for the calculation of pure coal C.

G. Thiessen and F. H. Reed, Fuel, v. 13, pp. 167–175, 208-217 (1934)

GRAPHICAL METHOD OF CALCULATING PURE COAL CALORIFIC VALUE

Pure coal is considered to be organic combustible matter, assumed to remain constant in average composition for a given seam over a delimited area, as the proportion of ash associated with it changes. The curves connecting calorific value (C) with ash content for fraction of a coal sample separated, by float methods, on a *d* basis have been studied for a number of Illinois coals. They were essentially linear except for values of ash content greater than 40 percent.

Extrapolation to zero ash gave pure coal C corresponding closely to that the action of steam on bituminous coke and on charcoal proceeded without disturbing side reactions, but that such side reactions, the true nature of which, however was not clear, occurred with semi-cokes.

The "heat of wetting" of the cokes was determined to obtain a measure of their surface activity. The changes in the coke substance with rising carbonizing temperature were shown to parallel changes in the heat of wetting, but a definite correlation between surface activity so determined and reactivity towards steam was not possible. The reactions envolved in the gasification of the sulfur in semi-cokes are discussed. A general discussion of the course of the gasification reactions leads to the conclusion that the primary reaction between coke and steam proceeds to a considerable extent, if not entirely, in accordance with the equation $C+H_2O \leftrightharpoons CO+H_2$, this is followed by the various secondary reactions mentioned above.

E. Terres, G. Patscheke, H. Hofmann, S. Kovac's and O. Lohr. Gas- u. Wasserfach 77, 585-7, 628-36, 650-4, 666-9, 681-4, 703-6 (1934).

ACTION OF SOLVENTS ON COAL

A study has been made of the benzene pressure extraction of Edenborn coal from the Pittsburg seam. Applications and methods are described for the pressure Soxhlet treatment of the coal, the determination of yields of soluble products, and their chemical separations.

Reduction in particle size of the coal increases the yield of products. Increased yields result also from heating the coal in presence of high pressures of benzene vapors up to 450° C, when combined with extraction at 260° C. The products resulting from benzene extraction at 260° C are largely neutral, with less than 3% acidic, basic and phenolic materials present. Combined extraction and high temperature heating result in increases in phenolic and basic materials, into increasing heating temperature and decreasing neutral ether-insoluble bodies indicating the possible formation of phenolic and basic materials from ether insolubles with benzene, under the most favorable conditions. Slightly less than 30% by weight of the coal has been made soluble. The curves of yield of soluble products vs. inverse time of extraction indicate that complete dissolution of the coal would be impossible under the conditions.

R. S. Asbury. Ind. Eng. Chem. 26, 1301-6 Dec. (1934).

Automatic steam pressure and combustion control (draft compensating type). Gas fired boilers at University of Mississippi.

New Precision Combustion Control

by J. B. NEALEY

American Gas Association

FIRING steam boilers with gas fuel with burners so controlled that there is little or no variation in steam pressure rendering the installation entirely automatic and eliminating the need for human supervision is now an old story. Boilers thus equipped are widely used throughout America. Many types of burners and controls with varying efficiencies are employed. Generally speaking, the control consists of a device, which, when actuated by the rise and fall in steam pressure, will in turn act to increase or decrease the flow of gas fuel to the burners below the boiler. A device for correctly proportioning the air and gas for efficient combustion is also supposed to be actuated by the same control but is more or less efficient as the case may be.

An entirely new principle in steam pressure and gas-air proportioning control reverses the action of present methods in that it is operated by a damper and by the fluctuations in draft velocities. This control was installed with the gas burners which were recently placed under the steam boilers at the Mississippi State College at Starkville, Miss. The power plant consists of a 400 hp. Sterling and a 300 hp. Heine while four 250 Sterling boilers are held in reserve as a standby unit. The 400 hp. boiler was equipped with 3 gas burners and the 300 hp. unit with 2 burners, all 5 being served from the same gas supply line. Formerly the boilers were fired with coal using mechanical stokers and the settings were unchanged, when the gas burners were installed, but the Dutch Oven was removed from the Heine. They are operated at 150 lbs. steam pressure.

The new installation consists of multiport tile block type gas burners with louvre shutters on the grid type openings for the primary air for combustion. The attached control is the only one that will maintain a constant and predetermined CO_2 for any rating of the boiler or throughout all fluctuations in firing, draft and gas pressure. Most boilers will drop in efficiency with a drop in load as indicated by a lower CO_2. In other words, the turndown is not sufficient to meet the minimum firing requirements when minimum loading is in effect, thereby burning more gas than is necessary.

For instance, take an atmospheric type burner, a throttling valve in the gas supply line and louvre type shutters in the air supply opening. When the boiler is operated at partial load the gas flow is correspondingly reduced and at the same time the louvres are partially closed. This partial closing of the louvres reduces the volume of air flow but also increases its velocity which upsets the atmospheric conditions within the furnace as indicated by a drop in the CO_2 content denoting a higher gas consumption than should be necessary. The unique feature of the new control is that combustion takes place practically with a maximum CO_2 under all conditions of boiler rating and firing and these ratings can be controlled by setting the stack damper and with no change in the louvre setting.

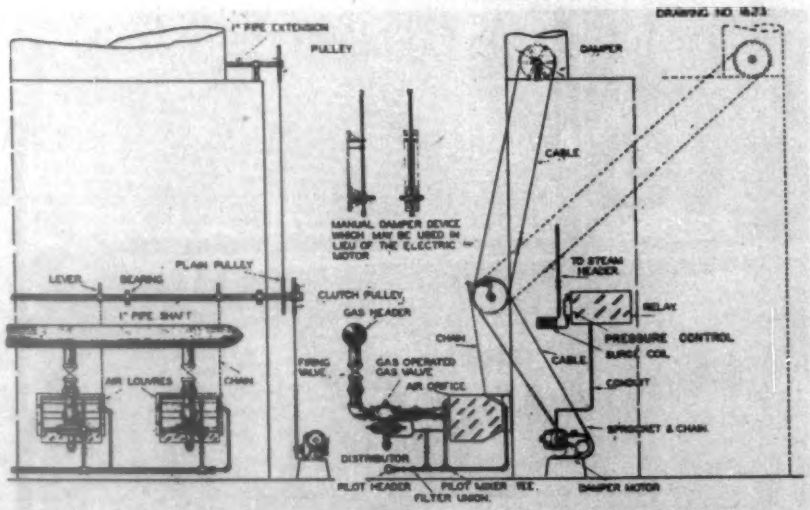
The steam pressure is maintained constant by its pressure on an element responsive to changes of pressure and controlling the damper mechanism which is attached to the stack damper. As the stack damper opens and closes it changes the draft in the firebox but at the same time it proportionately changes the amount of primary air drawn in around the gas burners. In other words, there is a unique gas-air proportioning device that automatically balances itself to maintain this ratio whenever there is a change in the gas pressure, the air pressure or in the boiler rating. This control has a diaphragm operated gas valve which is controlled from the proportioning device. The proportioning device is located between the dia-

phragm gas valve and the burner and consists of a small rotatable shaft, an arm and vane at each end, at right angles to it and extending in opposite directions to each other. The lower vane extends down into an open mouthed box bolted to the burner and forming a short tunnel through which the primary air is drawn for combustion. The other vane extends up into the gas supply line directly in the path of the gas flow.

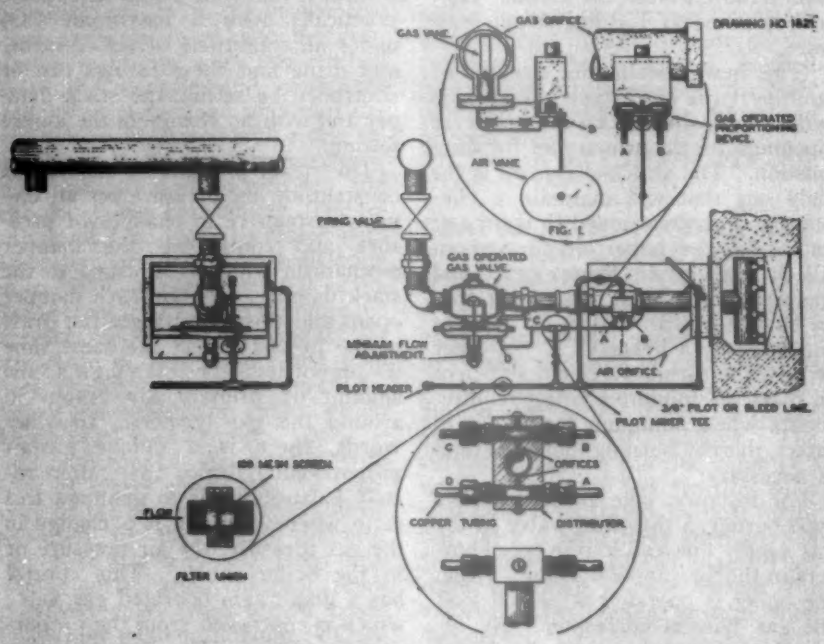
When the steam pressure control calls for more steam the damper starts opening, increasing the flow of air through the burner and air orifice, thereby causing the air vane to move forward. This forward movement closes a gas bleeder line to the lower side of the diaphragm, building up the pressure and forcing open the attached valve in the gas supply line. This gas valve continues to open until the flow of gas past the gas vane is strong enough to cause the entire device to go into the balanced position where the valve will remain until another change is called for. The reverse action will take place when the steam pressure control calls for less steam, which will move the vanes in the opposite direction reopening the first bleeder and closing the second to the upper side of the diaphragm.

In case of a sudden increase in draft due to outside conditions, the air vane will be pulled one way or the other until a balance is again attained and vice versa. If the balance is upset due to changes in gas pressure in the gas supply line the gas vane will cause the mechanism to move into the neutral position to overcome the change.

This control can be used with an electrically operated gas valve and an electrically operated damper mechanism working through mercury type relays which eliminates contact trouble. Or it can be used, as described, with gas operated gas valves with a hydraulically operated mechanism. In either case such devices as low water cut off, safety pilots, etc., may be used to give full protection in case of gas or power failure. The damper mechanism has a lift of 100 lbs., which is sufficient to operate the dampers for several boilers.



Typical installation of precision combustion control (draft compensating type). Gas operated gas valves—electric damper motor.



Arrangement of gas operated valve and gas operated proportioning device used with the precision combustion control system, draft compensating type.

Varnish With Precision Heating

Cooking varnish is a tricky undertaking for if the heat runs too high it bursts into flames while on the other hand, too little heat will ruin the entire batch. Heat or temperature control has been effected at the new plant of the Premier Oil & Lead Works, Los Angeles, California, with the use of gas fuel.

Most of the varnishes are built up from a chinawood oil base, and cooking is first in the process. In the cooking, a rapid high temperature is vitally necessary, as the chinawood oil is treacherous in heating and a varying heat might result in coagulation of the entire batch. In the first cooking, the batch is run up to a temperature of between 550 deg. and 575 deg. F. The balance of oils and resins are added, and again heated to the same temperature.

Economy in Volume Cooking

Unusually low over-all cost of cooking is the outstanding feature of the gas installation at the New York State Training School for Girls, at Hudson, N Y.

From accurate figures on gas consumption, it has been found that this institution is able to prepare meals three times daily for approximately six hundred people, at an average of 5.6 cu ft. per person, per meal. When the survey on this installation was first made the figure of 7 cu. ft. per person, per meal was taken; but careful instruction on the use of the gas equipment, regular inspection and adjustment of burners, etc., have gradually reduced the average fuel consumption to the lower figure.

—A.G.A. Industrial Gas News

The Engineer's Place In Today's Picture

ERICK LARSON

CHAIRMAN, DISTRIBUTION COMMITTEE, A.G.A.

ENGINEERING has been defined as the application of science and so extends from the infinite to the infinitesimal. No wonder the engineer has been called the "missing man" for in such a maze of knowledge an individual is but a speck in a universe. However, as a group engineers are one of the most important factors in present day civilization.

The conscientious efforts and group idealism of engineers has kept them in a peculiar and unrecognized position in the social scale, they seeming to derive an intense satisfaction from tasks well accomplished to which public acclaim adds but little. The retention of conscience but exposure to the limelight of public acclaim will still further broaden the engineering powers of accomplishment by an increased public confidence in engineering ability. Too often the engineer remains the scientist, turning with difficulty to application. Engineering training particularly fits a man to play a prominent part in readjustment periods.

Vision Needed

Vision is a fundamental necessity of engineering. Without it no man could successfully acquire a complete engineering education, for conception of the variety and magnitude of theories depends on vision.

Logic is a natural result of familiarity with the clearly conceived though complicated plans which science has recorded as the workings of nature. Logic is but clear, thoughtful, methodical analysis of a problem.

Adaptability is pointedly emphasized to the engineering student who contemplates in the least the forces of nature he studies.

Exactness and correctness are necessities in mathematics and a fundamental reason for the class consciousness of engineers. Many other requisites of an engineer could be listed but these are the most important.

Such cataloging of engineering qualifications still deals with the theory of science which has yet to be applied. Engineering is a source of facts, imagination and resources that needs only an outlet. What an outlet the utility industry of today provides, but incentive must be added!

We hear moans, groans and grumbling from those living in a reflected glory. Many eyes are focused on a fast fading past! Men who glued their eyes to financial statements and concentrated their purposes on accumulating worldly goods are being forced to view the law of averages and realize that confidence placed in men is of far more value than temporary elusive profits. Profits, and excellent profits, are necessary but are the results of man's efforts not the means by which man is employed.

Load Building

A study of the manufacturers supplying the needs of our industry furnishes examples of the possibilities that exist in readjustment periods. We feel we are different, non-competitive,—in a class by ourselves. We are not in a class by ourselves. The tremendous impetus given the gas industry by the adaptation of the electric light to all types of illumination was an example of what competition may do for us. History is but repeating itself. The identical cries of that but short yesterday are again raised. How can we cry rates can not be lowered and yet compare only thirty years ago and today? How can we fail to see the marvelous opportunities for adding loads when viewing the tremendous scope of gas utilization? Inventive genius has given us efficient means for adapting our fuel to all known heating fields. We rightfully and actively promote ranges, water heaters, refrigerators and house heating. But how about the thousand other common uses. There is a field in which the engineer may bask in the limelight. Only an engineering training would provide the faculties necessary for immediate recognition of such a maze of potential uses, furnish the necessary knowledge to provide for application and convince possible consumers. There is a wide difference between a merchandiser and a heat salesman. The former has certain specialties on which his attention is focused but within the gas industry we have a group of engineers whose potentialities for selling are beyond conception. They need not be full time salesmen nor altogether direct salesmen, but by using the personnel at their command together with their own efforts, successful results are inevitable. We must acquire every type of potential load and in our technical departments have the means of acquiring that load.

This may lead to the question of adaptability of engineers as salesmen. Referring back to his qualifications there is a natural desire on the part of an engineer to keenly analyze situations. Rather than a hasty offhand decision there is a real study of the possibilities in each field. Should results not be immediately forthcoming, enthusiasm does not wane, but further study soon determines the reasons and a helpful guiding hand extended rather than criticism of sales ability. The engineering tendency to extend keen thought with its attendant enthusiasm over a long period apparently is a unique characteristic of engineers. Merchandisers need continuous and recurring means of stirring enthusiasm whereas an engineer much more frequently averages his feelings over a whole problem and realizes when practical limits of efforts have been reached. Continuity of sales efforts rather than spasmodic campaigns have and will produce results.

A recent study of merchandising methods brought many fortunate contacts with sales executives, a surprising number of whom are engineers.

Attention should not be diverted entirely to sales although in that field the engineer is rapidly assuming

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* *Presented at Boston 1/11/35 at session of Operating Division of N.E.G.A.*

leadership. It is surprising although logical to find how many of the successful sales executives of today are engineers.

The technical field opens more opportunities than ever. Manufacture, transmission, distribution and utilization must be adapted to the changing economic demands. Convenient and profitable utilization places added demands on every other phase of the industry. There is a school of thought advancing the theory that the extension of mechanical science will be discontinued while social science modernizes itself. The reason for such contentions takes into consideration only a few of the outstanding accomplishments of the first quarter of the twentieth century. We will be as much the answer to this theory as the millions outside. Would you be willing to revert to the inconveniences of twenty-five years ago? We can not stand still, and therefore, we or our children will demand more and more conveniences, the fulfillment of which depends primarily on the creative mechanical genius of man. Admitting that we still retain an ancient social standard which demands the conveniences of today, what would happen with advancement in the knowledge of human relationship?

The rapid advance in complaints due to the greater use of low consumption burners, and automatic features is an attractive field, first for methods of minimizing complaints, and eventually through real study and effort, the elimination of the causes, even if we must find an entirely new process of manufacturing. A single study has led a concern into the field between the infinitesimal and creation itself, with the result that they return a learned engineer and scientist to the schools of pure science for further research. That surely is progress and indicates the need for engineers.

Transmission and Distribution Methods

Methods of transmission and distribution must be revised. Streets are required for more and more purposes. Large sized mains with low pressure transmission are rapidly being displaced. If pressure can satisfactorily be handled in transmission, why not in distribution mains? Without advocating any particular methods of distribution, the engineer should on all occasions free his mind of the stereotyped ancient arguments for any one particular method and meet the insistent demand for change. Meter measurement is dusty with old age and a fertile field for engineers. The method of billing our consumers is a detriment to increased use.

Pressure regulation is in its infancy. Far sighted engineers are already predicting that all appliances require and eventually will be individually controlled. Laboratory studies have already indicated such a necessity. Such a step would be no small item in the employment of the at present unproductive labor. Distribution practice would be materially affected as both higher and more variable pressures could be used. Any one change may affect all phases and the engineers must foresee and plan against abrupt changes.

In his technical endeavors the engineer must have personnel, necessitating organization. Organization and education are inter-woven. Here is a field of endeavor which can produce tangible results in short periods of time. Our contacts with men will always be interesting, for while the laws of science are exact and only change because of our lack of real knowledge, man is ever changeable, no two exactly alike, because fortunately or otherwise when created each was given the right to "choose of himself." The seeking out and minimizing of the flaws in organization is, therefore, perpetual but fascinating. Success results from as large an number of intimate contacts as possible. The engineer has a background of knowledge that naturally produces confidence. Confidence to be effective must be mutual. Between mutual confidence and a strong morale there is but sound executive judgment and interest. Under present apparently unsettled conditions a wonderful opportunity is presented to build a morale which will be reflected even in profit statements.

But can all this enthusiastic flow of words be put to practical application? *Absolutely.* Plenty of concrete examples can be cited within as well as without our industry. If an executive remains skeptical there are but two choices which time will make eventual, change in the type of such executive which allows present and unsatisfactory results to temporarily continue or to place confidence in one or more having vision and ability and invest them with complete authority. A study of qualifications indicates that the engineer far from being the "missing man" may between loss and profit be the "missing link."

Standards for Gas Service[1]

A Summary of National Bureau of Standards Circular 405

By E. R. Weaver[2]

DURING approximately two-thirds of the time since it was first commercially distributed, gas was used almost exclusively for the purpose of illumination with open-flame burners. Naturally the earlier specifications for gas were based on the property which made it useful, which was the brilliance or "candlepower" of its open flame. In order to make the measurement of candlepower significant, it was necessary to specify exactly the conditions under which the measurement was made, including the burner, and the rate and pressure at which the gas was burned. The same volume of the same gas burned with burners which were not substantially identical did not give the same amount of light. The same gas burned at different rates with the same burner did not give amounts of light bearing any simple relation to the amount of gas burned. It was impossible to compute the candlepower of a mixture of gases from the candlepower of the components. Because of this entire lack of recognized quantitative relationships, the user of gas, although his payment to the gas company was essentially for the purchase of illumination, could not know in quantitative terms how much illumination he would get for his money. The only practicable way in which the transaction could be regarded was as the purchase of a

[1] *Publication approved by the Director of the National Bureau of Standards, Department of Commerce, Washington.*

[2] *Chemist, Bureau of Standards.*

quantity (volume) of gas of specified quality; and candlepower was commonly referred to as the "quality" of the gas.

As the use of gas for open-flame illumination declined and its use as a source of heat for a multitude of purposes developed, candlepower specifications were gradually replaced by specifications for heating value; but traditions die hard, and the idea has persisted that heating-value and volume must be regarded as quality and quantity, although gas is used now almost exclusively as a source of heat, and the purchaser can know exactly how much heat he will get for a dollar. The electrical industry, starting at a much later period and unhampered by traditions, has never regarded current as quantity and potential as quality, but has from the start recognized the essential nature of the commodity, energy, which it had to sell, in spite of the fact that in many of its applications there is nothing like the sharply quantitative relationship between quantity of energy regardless of voltage (phase relations, etc.) and useful result that exists in substantially all present-day applications of gas.

A new publication, Circular 405, of the National Bureau of Standards, superseding the one familiar to many readers of this Journal as "Circular No. 32," considers gas service simply as the delivery of energy.

With the exception of a reasonable cost for energy, the one essential of good gas service is that appliances shall always be well "adjusted" for the conditions under which gas is supplied to them. Unless the orifice, in particular, is of the right size, the use of gas can be neither satisfactory nor safe. It is, therefore, of the greatest importance that the composition of the gas or its pressure shall not vary too greatly to permit a single satisfactory permanent adjustment, and equally important that the permanent adjustment of each appliance be correctly made with reference to the range of conditions which it will encounter. If local changes of pressure are of average magnitude and if the workman who adjusts an appliance is to do a good job, it is absolutely necessary that he know whether the pressure at the time of the adjustment is near the maximum, the minimum, or the average of those that will later prevail. If the adjustment is made on a July afternoon, for example, the adjuster should know something about the pressure that will occur on a January morning.

The custom of basing formal requirements on the variations of pressure within 24 hours has probably resulted from the difficulty of determining percentage variations of pressure over a long period of time rather than from a belief that they are unimportant. Gradual changes in conditions of distribution occur with changes of season, the obstruction of the mains, or the connection of additional gas-burning equipment; and these changes, which make earlier adjustments of the appliances incorrect, are the less evident from a study of daily pressure records under good control of the daily cycle.

If the practice proposed in the new circular is adopted, the gas company will outline such pressure districts as it chooses, in each of which it will maintain pressures between 50 and 100 per cent of a maximum specified for the district. Every gas fitter, whether employed by the gas company or not, can then confidently adjust each appliance for the range of conditions that will actually be encountered. In contrast to the practice formerly recommended, the new proposal greatly simplifies the interpretation of pressure data, makes it easy to determine that variations of pressure are not excessive over long as well as short periods of time, and provides the only arrangement that appears to have been suggested to make possible the intelligent control of appliance adjustment. It provides, moreover, a very definite basis for determining when and within what area the readjustment of appliances is necessary when changes of pressure conditions occur.

For the first time in a circular on service standards, definite recommendations are made as to the manner of paying for extensions of mains to serve new customers. There is probably no single subject in the whole field of gas practice in so confused a state as the provisions for the extension of mains. Of 259 companies that answered a questionpaire on the subject, 8 will invest nothing in extensions to serve new customers, 121 will make free extensions of specified length, 40 base extensions only on anticipated revenue, 86 base extensions either on standard length or anticipated revenue and 4 have rules which defy classification. Among the companies making extensions of standard length there are 23 different rules varying from 40 to 500 feet. Extensions based on anticipated revenue follow at least 20 different rules as to the ratio between it and the investment the company will make. Even the common and apparently simple provision that the main shall be extended one hundred feet for a new customer is subject to many varied interpretations and practices. The hundred feet is sometimes measured from the end of the existing main, wherever it is, sometimes from the center or one boundary of the lot of the customer last served; it may be measured to the point of connection to the service pipe of the new customer, or the center or one boundary of his lot. Street crossings are sometimes included in and sometimes omitted from the required 100 feet, while the problem of what to do at a corner is the subject of a long paper by one of the State Commission Engineers.

These are only a beginning of the variations which exist in practice, for the conditions under which the customers' payments for the remainder of the extensions are made, and under which deposits are refunded if other customers subsequently take gas from the same line, are even more confused than the subject of what the company will originally invest in the extension.

The practice recommended in the circular embodies the following principles:

1. The company will invest a definite sum of money in the construction of an extension. This eliminates questions introduced by the variable cost of construction, methods of measurement, etc.

2. The company's investment will be originally computed to make constant its investment in the distributing system per dollar of gross annual revenue.

3. The anticipated demand from a one-family residence is to be the average obtained by dividing the company's total send-out by the number of customers served. No recommendation is made regarding the method of estimating demand by customers of other types.

4. At the option of the company, the customers may be required to deposit the cost of the extension above the company's investment, or to pay a minimum bill sufficient to amortize the investment in ten years.

5. When additional customers are served through any part of an extension in which other customers have an investment, the company must make the same investment as though the additional customer required an entirely new extension.

6. This investment is used for new construction or the reimbursement of the customer-investors in accordance with the following principles:

(a) A new customer must not be required to pay more than the cost of the new construction required to serve him alone.

(b) An existing cusomer cannot

be required to pay for any part of the new construction to serve new customers.

(c) So far as possible, and consistent with (a) and (b) the customers' investments in the extensions as a whole are made proportional to the investment the company is required to make to serve each, as outlined above.

7. Any customer's deposit remaining unrefunded at the end of ten years reverts to the company.

The applications of these principles leads to a definite practice which seems to be universally applicable and which, during preliminary discussions with representatives of state commissions and the American Gas Association, was never criticized as being unfair in any detail. It was criticized as complicated, but it is difficult to see how any requirement could be made less complicated except by omitting from the rule and leaving for arbitrary decision one or more questions which must constantly recur.

The rules relating to pressure and to extensions of mains are two of several somewhat unusual though not entirely novel recommendations in Circular No. 405. Among other things, it is recommended that rates be based on definite charges per unit of energy instead of per unit of volume, that minimum standards of heating value for natural gas be strictly avoided, that gas companies be relieved of the obligation to make periodic tests of meters through which so little gas is used that there is little likelihood that an overcharge greater than the cost of testing the meter will occur, that the distribution of an unstable gas be prohibited instead of rewarded, that in cases of deficiency of heating value customers be charged for only what they get, and that the gas companies install, own, and maintain service pipes of ordinary length.

The discussion of technical questions is more detailed than in previous editions of the circular. Sections are devoted to explaining the characteristics and the adjustment of appliances in relation to the composition of gas; to the heating-value of butane-air mixtures in relation to vapor pressures, storage capacities, and the adjustment of appliances; to the condensation of hydrocarbons in the mains in relation to plant operation and particularly the inert content of water gas; to the choice of the kind of gas which is to be distributed; to the different relationships of demand to cost in the cases of natural and manufactured gases. These and other elementary discussions should enable even the non-technical reader to follow the reasons for all technical recommendations through to the operation of the customer's appliance or to his pocketbook.

Approximately a third of the circular is occupied by a digest of existing rules relating to gas service, so arranged that the provisions in various states relating to any one subject can be readily compared. A group of tables present a summary of what gas companies, themselves, regard as good practice, as revealed by a questionnaire. There is also a description of the properties and the sources or methods of manufacture of city gas supplies with some discussion of their selection.

Circular No. 405 may be purchased from the Superintendent of Documents, Washington, D. C., for 20 cents.

Flame-Cutting And Beveling Pipe By Machine

FOR taking up old gas or oil lines and for cutting and beveling pipe in the field or shop, oxy-acetylene pipe-cutting machines offer the advantage of speed and economy.

One of the most important uses of these machines is in the taking up of old lines having screw or other mechanical joints. Such lines are usually relaid with oxwelded joints. One type of portable cutting machine has been developed especially for this kind of work.* Two blowpipes are held at correct angles and so positioned with respect to a coupling or joint that the latter will be cut off at both ends simultaneously. The new pipe ends thus produced are smoothly and accurately cut.

Since the angle of the blowpipes may be adjusted at will, any desired bevel may be obtained on the pipe ends. The bevel itself, depends largely on what method of welding is contemplated. The Lindeweld process, for example, requires less bevel than that customarily used for neutral flame oxy-acetylene welding. With smaller bevel angles, the welding rod and gas consumption, as well as the welding time, is considerably less.

For certain work another type of machine for pipe cutting and beveling is preferred.** This has a single blowpipe and is desired for use on open end pipe. This includes pipe which is old and has rough ends, pipe which has been inaccurately cut with a hand blowpipe, or pipe with screw threads to be cut off.

Rough hand-cut ends ingeniously machine trimmed from the inside.

It had, for example, been the intention of one company to use screw couplings when re-laying several thousand feet of 20-in. pipe for a gasoline plant. A demonstration by an oxy-acetylene service operator convinced the management that the line should be welded. All the threaded pipe ends were therefore cut off with the machine for open end pipe, and at the same time, beveled. In this connection it is well to emphasize that as a safety measure, all lines should be freed from any oil or gasoline before welding or cutting is attempted.

This machine is centered in the pipe by means of three arms adjustable by means of a cranking handle

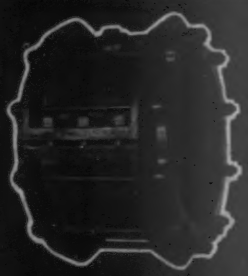
(Continued on page 28)

*Oxweld Type CM-3 Pipe Cutting Machine.

**Oxweld Type CM-7 Pipe Beveling Machine.

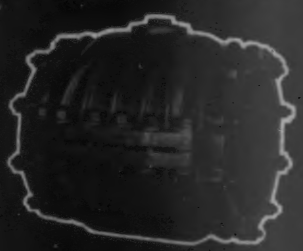
FOR *QUICK* REPAIRS
USE THESE SPLIT SLEEVES

When steel pipe or steel pipe joints break or leak, repair them quickly and *permanently* with a Dresser Split Sleeve and save time, trouble, and money. Such repairs can be made by ordinary labor—in most cases without interruption of the service. For emergency repairs, a Dresser Sleeve or two in stock may save hundreds of dollars. There's a Dresser Repair Sleeve for almost every type of leak. When ordering, specify outside diameter of pipe, operating line pressure, and kind of repair to be made. Rush orders are given special attention.



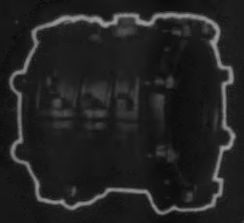
STYLE 52-A

This Split Sleeve will completely enclose and permanently repair *plain circumferential welds, screw collars, welded bell and spigot joints* and *double bell welded joints*. It will also cover splits or holes in the pipe up to 8" in length. Style 52-A is recommended for working pressures up to 500 lbs. per sq. in. and is available in all the standard steel pipe sizes from 4" I.D. to 26" O.D. inclusive. Write for further information.



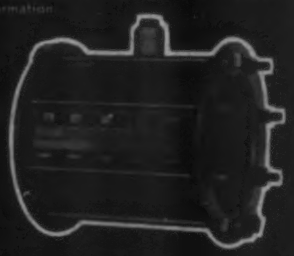
STYLE 54-A

The style 54-A has sufficient inside clearance to completely enclose and permanently repair *leaking joints of the bolted coupling type*. It is recommended for working pressures up to 500 lbs. per sq. in. Sleeves of this style are available in all standard steel pipe sizes from 2" I.D. to 26" O.D. inclusive. Write for further information.



STYLE 73

The purpose of this light, inexpensive Split Sleeve is to enclose and permanently repair *plain circumferential welded joints* and *screw collars*, as well as splits or holes in the pipe up to 8" in length. Two or more of these Sleeves can be joined together for larger breaks. Style 73 is recommended for working pressures up to 250 lbs. per sq. in. and is available in standard steel pipe sizes from 2" I.D. to 12" I.D. inclusive. Write for further information.



STYLES 12, 13, 50, 380 and 400

Above is illustrated a typical Dresser welded steel split sleeve of a type that is furnished when a *special pipe size* or *unusual enclosure* does not permit using Styles 52-A, 73, or 54-A. Welded steel split sleeves are built to order to meet the particular requirements of the repair. Detailed information should be furnished when ordering.

A Dresser Sleeve On Hand Today May Save You Hundreds of Dollars Tomorrow

S.R. DRESSER MFG. COMPANY

Bradford, Pa.

In Canada: Dresser Mfg. Co., Ltd. 32 Front St. W. Toronto, Ontario

Flame Cutting and Beveling by Machine

(Continued from page 26)

to fit any size pipe from 8 in. to 24 in. in diameter. The arms are mounted on a central shaft. To this shaft is attached the rotating arm that holds the blowpipe and guides it along the line of cut.

A unique feature demonstrating the adaptability of this type of pipe cutting machine was recently brought out in some work on the Pacific Coast. Many miles of welded 36-in. and 44-in. steel water lines had been taken up and some of it was to be re-laid. These lengths had been taken up by cutting through the welds with a hand blowpipe. As the specifications required that the ends be square with the axis of the pipe, the ends of all lengths to be re-laid were trimmed with the cutting machine.

It appeared that there might be some difficulty in doing this work, as the portable cutting machine on hand was designed to handle pipe not more than 24 in. in diameter. The three adjustable arms were too short to be expanded against the walls of the 44-in. pipe, and the rotating arm on the central shaft was not long enough to hold the blowpipe in the usual manner on the outside of the pipe.

Beveling machine being adjusted to remove threaded pipe ends.

By lengthening the links of each adjustable arm and by mounting a cutting blowpipe so as to cut the pipe from the inside, the difficulties were ingeniously overcome. The trimming was quickly done to specification.

Cutting with a hand blowpipe would have been less than half as rapid, the gas consumption could have been greater, and the job might not have met the specifications.

Cutting with any of the various types of oxy-acetylene pipe cutting machines is very rapid. On a job involving the taking up of 12 miles of 8-in. and 10-in. oil lines, 138 screw couplings were removed from the 10-in. pipe in 10 hr.

There are a multitude of similar examples to show that the flame-cutting and beveling of pipe by machine does an efficient and economical job.

Gas Pressure Controls

(Continued from page 16)

Diaphragms

Leather diaphragms are cut from a single skin of either sheep or calves. Diaphragms secured from reliable manufacturers are selected for their particular service with extreme care. A detailed set of specifications as to the methods of tanning, section of skins selected, location where sheep or calves were raised, brand of cattle and numerous others are unnecessary in securing a good quality of diaphragm leather as they handicap manufacturers who may have access to small quantities of high grade leathers which do not meet some particular but unimportant part of the specification.

Where the differential pressure between the two sides of a diaphragm does not exceed four lbs. per square inch, two layers of leather are usually used as the flexibility of the leather provides a better quality of control in the lower pressure ranges than a combination of leather and rubber. Between four and ten pounds differtial in pressure a leather diaphragm is placed adjacent to the gas and usually backed up with a single ply 16th inch thick rubber diaphragm. From ten to one hundred pounds differential pressure two ply 8th inch rubber diaphragms are ordinarily used. Above 100 lbs., additional thicknesses of rubber diaphragms are used in addition to the single leather, when necessary, although a rubber diaphragm having two plys of heavy duck will stand exceptionally high pressures when reinforced over the greatest possible area with a metal plate leaving only a small part of the diaphragm free to move.

The building up of a diaphragm beyond two ply of duck especially where the diaphragms are cupped, results in a lack of flexibility and decreases the sensitivity of operation. At the extremely high pressures sensitivity is not usually an important factor.

The design of many regulators provides cupped shaped diaphragms, the leather portion being blocked. Cupping slightly decreases the diaphragm flexibility but minimizes the possibility of leakage between the flanges through lack of creasing. The compounded diaphragms such as reinforced rubber are usually cup shaped for the same reasons. Cupping of all diaphragms while causing a slight stiffening does eliminate the possibility of the diaphragm restricting valve travel due to its being stretched too tightly during installation. Regulators should also be designed so that all bolt holes and stem locations are standard permitting factory punching of the diaphragms. Pre-punching will provide sufficient excess leather inside the regulator to allow full movement of the stem, and eliminate the possibility of insufficient movement of the diaphragm preventing the valves from closing.

Re-inforced rubber, impregnated or coated linens and duck, thin sheets of metal and other flexible materials have been tried for regulator diaphragms but none give the reliable service and length of life of the better grades of leather. Where combinations of leather and rubber or other compounds are used the purpose of the leather is to prevent the direct contact of gas with such compounded diaphragms as compounded diaphragms are usually more susceptable to chemical and physical action from gas than leather.

Practically all leathers for diaphragm purposes are bark tanned, although the chrome and semi-chrome treatments given to meter diaphragms are satisfactory. Bark tanning is preferable as diaphragms are seldom exposed to continuous sweeping action of gas and a slight shrinkage or stretching of the diaphragms would not affect regulation to the extent it would gas measurement.

The common specifications for diaphragms are that they be gas tight; provide sufficient strength in a single unsewed piece to allow using large size diaphragms to secure sensitivity; possess flexibility; be practically unaffected chemically or physically by gas in the period adopted for their life; be easily shaped and not weaken or crack with continuous flexing.

Continued in March Issue

Linde Process Service

speeds-up laying of

Sea-going Pipe Line

UPON completion of an oil pipe line to load tankers a half mile out to sea, the Chief Engineer of the oil company was so pleased with the aid rendered by Linde Process Service that he wrote:

"We have recently constructed and successfully launched a 16-in. Submarine Line. The perfect consumation of this job was in no small measure due to the extraordinary efforts of your service organization. We are deeply appreciative of the splendid cooperation accorded us by your company."

This is Linde Process Service at work. It brings to Linde customers —at no extra cost—the latest and best pipe-line welding methods, assists in training and qualifying operators, and helps organize welding operations to insure satisfactory performance.

The nearest Linde Sales Office will gladly give you full information on Linde Process Service. These are located at: Atlanta—Baltimore, Birmingham, Boston, Buffalo, Butte —Chicago, Cleveland—Dallas, Denver, Detroit—El Paso—Houston—Indianapolis—Kansas City—Los Angeles—Memphis, Milwaukee, Minneapolis—New Orleans, New York—Philadelphia, Phoenix, Pittsburgh, Portland, Ore.—St. Louis, Salt Lake City, San Francisco, Seattle, Spokane and Tulsa.

● OUT TO SEA—for a half mile this 16-in. Oxwelded pipe line rests on ocean bottom . . . supplies tanker cargoes.

● FIVE DAYS—from delivery of pipe to finished job. Linde Process Service cooperated. Oxwelding assured strong, permanent, leakproof, jointless line.

Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through producing plants and warehouse stocks in all industrial centers.

The Linde Air Products Company

Unit of Union Carbide and Carbon Corporation

In Canada:
Dominion Oxygen Co., Ltd. Toronto

YOU CAN ORDER EVERYTHING FOR OXWELDING AND CUTTING FROM LINDE

MAGIC CHEF

AUTOMATIC HEAVY DUTY EQUIPMENT

for Modern Gas Cooking Needs

● Users of heavy duty equipment, including the most pretentious hotel or steamship, to the most modest restaurant or barbecue stand will find it worth while to investigate the many advanced features of the Magic Chef Automatic Heavy Duty Line.

This new line represents equipment that really meets the demand of modern conditions with all the efficiency, convenience and economy that in many cases makes the difference between an operating profit or a loss. These features include extra heavy oven insulation for cooler, more comfortable kitchens, substantial saving of gas, streamline design with easy cleaning and sanitation, more wholesome and delicious food because of more even and controlled heat, automatic lighting, speed, safety, dependability and durability.

The streamline design permits harmonious, close-fitting assembly of units in a continuous bank or battery, in any combination to meet individual requirements. It provides a continuous cooking top on ranges and sanitary smooth surfaces for easy cleaning. Front and bottom frames of all equipment are made of heavy, non-breakable angle iron. All fittings—hinges, manifold, valves, cocks and other mechanism are concealed, yet easily accessible. For complete details write for descriptive catalog.

AMERICAN STOVE COMPANY

World's Largest Manufacturer of Gas Ranges

BOSTON • NEW YORK • ATLANTA • CLEVELAND • CHICAGO
ST. LOUIS • PHILADELPHIA • SAN FRANCISCO • LOS ANGELES

Magic Chef
AMERICAN STOVE COMPANY

LOOK FOR THE RED WHEEL WHEN YOU BUY A MAGIC CHEF

"SUCCESSFUL SELLING"

"There's Gold in Them Thar Hills"

The "Gold Rush" was the name given to the fourth annual all employee campaign conducted by the Minnesota Northern Power Company, Minneapolis, Minn., during September, October and November, 1934. "Real Gold" was found by 77% of the employees and an increase of 74% in business was the result. Both gas and electric appliances were sold.

A competitive spirit prevailed among the twelve divisions of the company, (mining camps), serving approximately 30,000 customers (both gas and electric) for the Heskett Trophy presented by R. M. Heskett, General Manager of the Company to the "Outstanding Division of 1934" that has done the best job in all departments—sales, operating and accounting—during the campaign. Besides this there were Safety and Accounting Awards.

Mining terms were used throughout the campaign and the weekly bulletin, "The Prospector", kept the miners informed of the progress.

Employee Inducements

Tying in with the Gold Rush Theme, credit in ounces of gold ore mined were given for each gas appliance sold on the following basis:

Reconnected customers 30 oz.
Conversion burner .....30 oz.
Furnace or boiler .....30 oz.
Floor Furnace .....15 oz.
Circulating Heater ....15 (250) oz.
Radiant Heater .....10 (150) oz.
Gas Range .....10 (75) oz.
Gas Water Heater ....10 (125) oz.
Electrolux .....10 (75) oz.

Figures in parentheses indicate credit in ounces of gold ore for sales in manufactured gas properties.

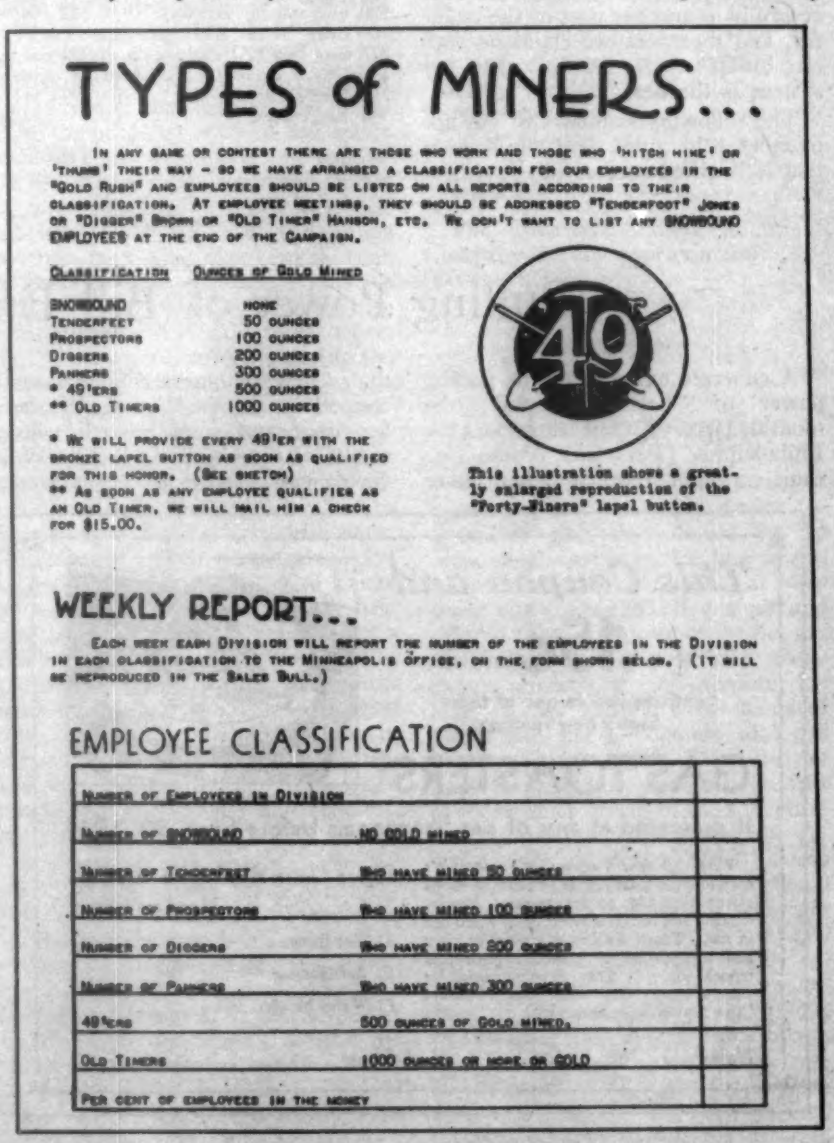
An additional bonus of $5.00 was paid to each employee responsible for the re-installation of any conversion burner that has been off the lines since November 1, 1933.

Weekly reports on appliances sold were made by each Division and "Gold Certificates" were issued for gold ore mined. These certificates were cashed in at the end of the campaign for prize money.

No inducements were given to the public during the campaign other than standard terms. Nor was there any special advertising campaign. In explaining this A. E. Schwartz, sales manager, describes the policy of the company as follows:

"Experience has taught us that it is of more value to the company to keep our sales force selling than to keep our public buying. We spend more money comparatively, with our sales organization keeping them on their toes, than we do attempting to get the customers to buy our merchandise.

"For instance, if we are going to reduce the price of a range $20.00 to clear our stock, we usually reduce the price $5.00 or $10.00 and give the salesman a $10.00 bonus for making the sale. If we are reducing the price only $10.00, we give it all to the salesman. This keeps the money



TYPES of MINERS...

IN ANY GAME OR CONTEST THERE ARE THOSE WHO WORK AND THOSE WHO 'HITCH HIKE' OR 'THUMB' THEIR WAY — SO WE HAVE ARRANGED A CLASSIFICATION FOR OUR EMPLOYEES IN THE "GOLD RUSH" AND EMPLOYEES SHOULD BE LISTED ON ALL REPORTS ACCORDING TO THEIR CLASSIFICATION. AT EMPLOYEE MEETINGS, THEY SHOULD BE ADDRESSED "TENDERFOOT" JONES OR "DIGGER" BROWN OR "OLD TIMER" HANSON, ETC. WE DON'T WANT TO LIST ANY SNOWBOUND EMPLOYEES AT THE END OF THE CAMPAIGN.

CLASSIFICATION	OUNCES OF GOLD MINED
SNOWBOUND	NONE
TENDERFEET	50 OUNCES
PROSPECTORS	100 OUNCES
DIGGERS	200 OUNCES
PANNERS	300 OUNCES
* 49'ERS	500 OUNCES
** OLD TIMERS	1000 OUNCES

* WE WILL PROVIDE EVERY 49'ER WITH THE BRONZE LAPEL BUTTON AS SOON AS QUALIFIED FOR THIS HONOR. (SEE SKETCH)
** AS SOON AS ANY EMPLOYEE QUALIFIES AS AN OLD TIMER, WE WILL MAIL HIM A CHECK FOR $15.00.

This illustration shows a greatly enlarged reproduction of the "Forty-Niners" lapel button.

WEEKLY REPORT...

EACH WEEK EACH DIVISION WILL REPORT THE NUMBER OF THE EMPLOYEES IN THE DIVISION IN EACH CLASSIFICATION TO THE MINNEAPOLIS OFFICE, ON THE FORM SHOWN BELOW. (IT WILL BE REPRODUCED IN THE SALES BULL.)

EMPLOYEE CLASSIFICATION

NUMBER OF EMPLOYEES IN DIVISION		
NUMBER OF SNOWBOUND	NO GOLD MINED	
NUMBER OF TENDERFEET	WHO HAVE MINED 50 OUNCES	
NUMBER OF PROSPECTORS	WHO HAVE MINED 100 OUNCES	
NUMBER OF DIGGERS	WHO HAVE MINED 200 OUNCES	
NUMBER OF PANNERS	WHO HAVE MINED 300 OUNCES	
49'ERS	500 OUNCES OF GOLD MINED.	
OLD TIMERS	1000 OUNCES OR MORE OF GOLD	
PER CENT OF EMPLOYEES IN THE MONEY		

in our own organization, gives us a happy sales organization, does not demoralize our market and we are not known as a cut-price firm, and our men get out and push these lines.

"The only special we ever offer on campaigns are special terms on down payments and paper carried over a longer period than usual. We never cut the price and always get a standard carrying charge on our time paper. 90% of our advertising is institutional type, selling the use of gas or electricity for the home, and we never carry the price of the merchandise on the ad.

"I realize that all of this is a little bit unorthodox in present day selling methods, but it has worked successfully for us and as long as it does we feel it is good business to keep on with it. Naturally things that work well in one territory or part of the country do not always work successfully in another part of the country, and therefore we claim no special credit or do we feel that our system is the best."

The following summary of gas appliances sold gives every indication that it "worked successfully":

GOLD RUSH CERTIFICATE

THIS CERTIFIES THAT

The _____ Division

has qualified for _____ ounces of Gold Ore mined at

their _____ claim.

This certificate can be redeemed for cash at the end of the campaign, November 30, 1934, at the Syndicate Headquarters of the Gold Mining Company, 821 Second Avenue South, Minneapolis, Minn., at the rate of not less than $.035 per ounce. This certificate must be counter signed below by Mine Boss before it will be paid.

This _____ day of _____ 1934.

OFFICE OF CHIEF ASSAYER

Please redeem this pledge in cash at highest market value. The cash will be divided among employees working my claim who have worked the hardest to produce the GOLD ORE MINED (load added to line).

Signed _____ Mine Boss of _____ CLAIM

GAS			CU. FT.
88 Reconnected Customers 259 Conversion Burners 77 Furnace & Boilers	424	at 200,000 cu. ft. annual consumption..	84,800,000
152 Floor Furnaces 590 Circulating Heaters over 30,000 BTU input	742	at 75,000 cu. ft. annual consumption..	55,650,000
277 Gas Water Heaters—at 35,000 cu. ft. annual consumption.....			9,695,000
599 Gas Ranges—at 20,000 cu. ft. anual consumption.....			11,980,000
758 Radiantfires 41 Electrolux	799	at 15,000 cu. ft. annual consumption	11,985,000
		Total	174,110,000
		At 50c per M. cu. ft.	$87,055.00

Pulling Power of Bill Enclosures

A concrete example of the pulling power of "Leisure Hours", the monthly gas bill enclosure of the Philadelphia (Pa.) Gas Works Co., came to light recently when more than 4,600 customers clipped a small coupon on the back of the September issue and went into the showrooms of the Company to buy Wolf visible gas toasters at a special, reduced price of 15 cents each, plus the coupon. As the offer was made only through *Leisure Hours*, the test was an ideal one and proved beyond all doubt that the little paper is widely read.

This Coupon and

15c

entitles you to one of these handy new folding

GAS TOASTERS

(Regular 25c Value)

If presented at any of our Showrooms before Sept. 30, 1934

With this new Visible Gas Toaster, it's easy to have toast just as you like it—both sides crisp and golden brown. Sturdy, durable and convenient—it folds when not in use. Toasts 4 slices at a time, quickly and inexpensively. Special price this month—only 15 cents, if accompanied by this coupon. Get your toaster today! Offer expires September 30th.

Please Check Appliances You Own

How long in use?

☐ Gas Range .....

☐ Refrigerator .....

☐ Water Heater .....

Name..... Address.....

Coupon clipped from "Leisure Hours"

It is interesting to note the gas consumptive value of these small appliances. A moderate estimate of the gas consumption of a top burner is 18 cubic feet per hour. The gas toaster, being used on an average of 5 minutes daily, which is a very conservative estimate, would burn 1 hour each twelve days, or 30 hours per year. This means that each toaster would consume 540 cubic feet of gas per year, and that the 4,600 toasters sold through *Leisure Hours* would consume 2,484,000 cubic feet yearly. At $.85 per 1,000 cubic feet the annual revenue derived from the toasters alone would total $2,094.40.

In short, the toasters sold to date by the little coupon, if used but 5 minutes daily for 1 year, would consume gas sufficient to completely fill holder No. 1 at Station B, which has a maximum capacity of 2,353,000 cubic feet.—*(Courtesy The P. G. W. News).*

156 Automatic Gas Water Heaters Sold in 53 Days

By W. L. C. LANG

Supervisor Mdse. Sales, Delaware Power & Light Co., Wilmington, Del.

WE had heard considerable about the "Rental Plan" of installing automatic gas water heaters, the whys and the wherefors, the pros and the cons. While all the reports of sales and installations had been favorable, the necessity for "rental" was beyond our comprehension. Inasmuch as the purpose appeared to be to reduce the selling price of the heater and extend a long term payment plan to the purchaser, the word "rental," to us, appeared to be more or less of a camouflage, particularly as our experience in merchandising had been that consumers do not want to rent anything. They want to own the merchandise in their homes, and as each month elapses they like to possess a greater equity in it.

It is agreed that when a prospect is approached with a rental proposition he feels the company is willing to "hold the bag" (and this may impress him), but why not sell him the appliance on a long term basis? He won't keep it under any plan if you have misrepresented its quality or operating cost.

Clear thinking merchandisers have for years been puzzled by the fact that it is possible to sell 500 or more automatic refrigerators, at average prices in excess of $200, whereas it is almost impossible to sell 200 or less automatic heaters, at average prices less than $80. This had not been untrue in our situation.

We in Wilmington, had been asking ourselves one question for some time. The question was: "Do the majority of our customers want automatic water heaters?" We felt sure the answer was "yes," and had had a plan in our collective mind to test it. All we had hoped for was an opportunity to apply the test.

Fortunately, we had a rate reduction last September, and it gave us the opportunity we had awaited—to try our long term payment plan. Following are the three major appeals we used in our advertising and selling plans:

1. New Lower Rate—90c per thousand in excess of 3,000 cu. ft.
2. $3.00 Guaranteed gas bill—50 gallons of hot water per day.
3. 95c down—$1.00 per month. (No free trial advertised.)

Prior to the campaign, a survey had been made by our meter readers of the methods used by our consumers to heat water. We built up a file of "bucket-a-day" users (coal), inasmuch as they were the greatest majority. A man using a coal stove to heat water is always the best prospect for a gas heater, because the coal stove makes work for him and the gas heater relieves him of all his work and worry. It is also true that he is your best salesman after he changes over to gas, provided he does not abuse the new method. Therein lies our greatest difficulty. An automatic gas water heater produces results so rapidly that the user is apt to waste the water. With his old system he had to pay a penalty of giving more attention to his "Coal Hog" or of doing without hot water until he could build up a new supply.

One of the most important phases in any campaign is to release the salesmen from all other obligations so they may give their entire time to the execution of sales. This we did, and the salesmen received liberal compensation for their work. You cannot get results by leaving the salesman on the outside, because you have reduced your price to the purchaser. After all, an automatic water heater is not nearly so important as a builder of merchandise volume as it is a "load builder." The inducements for the salesmen were: Commission 12½% plus extra 2½% if quota was reached. Also prizes of merchandise offered for the first and second highest salesmen, and a merchandise prize for inside sales person. First prize to outside salesman was $49.50 radio, second prize any $15.00 merchandise item in our store. Prize to inside sales person with highest number of sales, a single slice toastmaster and hospitality tray.

Advertising a guaranteed gas bill of $3.00 per month attracted many people. But, strangely, 95 per cent. of the heaters sold were of the *fast recovery* type instead of slow recovery. This proves another thing—the average consumer feels that $3.00 per month is a fair amount to pay for water heating service, but he objects to being limited in case he should need more than 50 gallons of hot water a day.

Considering the fact that this campaign was conducted in the fall of the year, we feel well compensated for our efforts in the sale of 156 automatic gas water heaters in 53 full working days. In the spring of 1935 we expect to do great things with this same plan.

ANALYSIS OF SALES
SHOWING KIND OF FUEL REPLACED
BY
AUTOMATIC GAS WATER HEATERS

Bucket-a-Day stoves	84
Circulating water heaters	39
Oil	3
Automatic water heaters	11
No present method of heating water	19
Furnace coils	
New residences, etc.	
Total	156

The Delaware Power & Light Company serves approximately 28,000 consumers.

Dealer Cooperation

One of the big mid-western gas companies is operating a dealer cooperative plan that should set up some new records in this line of gas range sales promotion. The gas company has contacted all dealers and offered them a plan whereby the gas company will use good size newspaper advertising to promote the sale of gas ranges with insulated ovens and list all dealers that sell this type of ranges. They do not hope to ginger-up dealers by simply carrying their names in the advertisements, they go further and are going to pay the dealer $2.50 in cash for every insulated range he sells and as an added inducement they are going to pay the dealer's salesman $1.00 for every range he sells. This activity and the idea behind it, gentlemen of the gas industry, is to keep the cooking load in a city that boasts that it has the lowest electrical rate in the country. The gas man is getting and keeping the cooking load simply because he is going after it.

Short Appliance Campaigns Pep Sales Staff

By Chas. D. Greason

Dir., Publicity and Advertising, The Gas Service Company, Kansas City, Missouri

SHORT appliance campaigns of a few days duration, with special discounts offered to the public and an extra bonus offered to the salesmen, have proved successful in The Gas Service Company properties. This company has 22 sales departments in its larger gas distributing properties operating in two states, Missouri and Kansas.

Three short campaigns were tried for the first time during 1934. The first one, a 5-day range campaign held September 3 to 8, inclusive, resulted in the sale of 435 ranges of three makes, Detroit Jewel, Roper and Magic Chef. The second short campaign was a 7-day campaign which was called the Thanksgiving Range Sale and held from November 21 to 28. In this campaign 631 ranges were sold. A short campaign on water heaters was held for 12 days in December, from December 3 to 15, which resulted in the sale of 184 Walker-Pittsburg automatic storage water heaters.

These three campaigns were inserted in the long heating campaign which was held over several months. These short successful campaigns added materially to the enthusiasm of the salesmen and at the same time did not detract from the results of the regular campaign. After the short campaign was over the salesmen went back into the longer campaign with more pep and enthusiasm. The short sales also provided the company an opportunity to clear out stocks on hand, this being particularly true of this company's range sale in the latter part of November and in the water heater campaign early in December.

The primary contributing factor to the success of the short campaigns was a special discount offered only during these campaigns. In each case the special discount was 15 per cent. To stimulate the sales force in the campaign a small bonus was offered in each instance for the particular equipment being featured during these short periods.

Newspaper advertising was used in practically all of the properties, announcing the campaign and showing the dates on which the special discounts would be in effect. No other type of advertising was used. Most of the larger properties, of course, had the advantage of window displays in which the dates of the sale and the discount were again featured.

Because of the success of the short moves in both water heaters and ranges a number of similar short campaigns are planned by F. M. Rosenkrans, general new business manager of The Gas Service Company, during 1935.

High Type Sales Organization

As we view it this is the most opportune time for the gas man who wishes to build up an A-1 salesforce. There are many first class salesmen seeking jobs these days. These men have sold all types of high class specialties and services. They are men who in the dark days of 1929 and thereabouts were in the real money—they even purchased stocks and fancy fixins'. Today, after trying this and that for the past two or three years, they have come to the realization tnat those days are over—but they are men of such character as can't be downed. They want opportunities to earn a reasonable salary. Don't mistake, these are not the class that want a $75.00 drawing account and will be satisfied with that. They are men that you will have to pay at least $100.00 per month to start with plus anything they may be able to earn above that on a commission basis. And carefully picked they will earn more and on the second month may want a smaller drawing account and a higher rate of commission.

We know of a plan of this kind that is working. The manager of the company employing the salesmen writes monthly earning checks that we are afraid to name, as the man who is accustomed to paying his men a straight commission or a small salary and commission would say we were over-stating facts. However any man who has been in the salesmanager's seat for the past three, ten, fifteen or twenty years knows full well that there is no economy in employing cheap men as sales representatives. Think it over if you want to go along and retain your domestic load—then get busy at once to build up a real organization of salesmen.

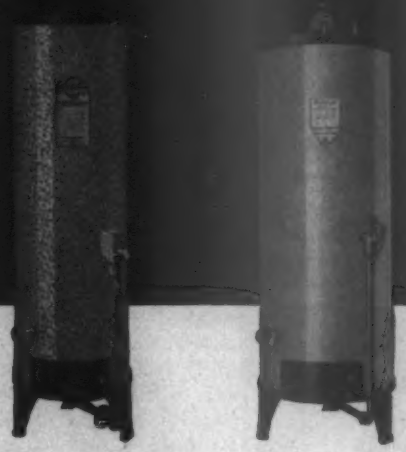
Back of these

Water Heaters

is Sales Service and Manufacturing Background

HERE'S HOW WE HELP YOU SELL:

- 3 piece Direct Mail Campaign, furnished *Free.*
- Attractive, sales-producing catalogues in color.
- Arresting displays for your window, including full size, full color replicas of the Water Heaters.
- Colorful truck banners.
- Newspaper Mats and Cuts.
- Trade Paper Advertising to the Heating and Plumbing Industry, Architects, Builders, Chain Store Operators, etc.



(left) **AGP REGULAR** Gas-Fired Automatic Storage Water Heater; 20 to 75 gallons. Baked enamel steel jacket over Galvanized or Everdur tank; only one gas connection

(right) **THE DICTATOR** Low Priced Water Heater. Fully automatic, thermostatic valve; baked enamel jacket and tank of Galvanized or Everdur. 15 to 40 gallons.

AGP

Don't buy just a water heater, to stand and gather dust and deficits on your sales floor...or to bounce back later with troublesome service calls and customer dissatisfaction. Buy *Sales Service*—to move the product out and move the profits in. Buy *Manufacturer's Background*—the dependability and integrity of the maker that helps to sell the product and keeps it sold.

Each of these Automatic Storage Water Heaters by AGP carries with it an assurance of sales and profit, and of satisfaction to your customer. When their obvious advantages are explained, they sell quickly. And they stay sold, and build good will for you.

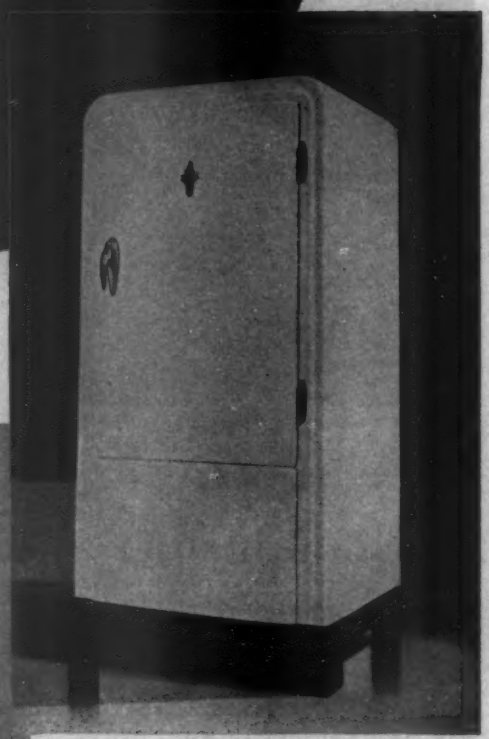
Write today for details and prices...and for the new, powerful sales promotion material that will help you sell *more* Water Heaters.

AMERICAN GAS PRODUCTS CORPORATION
DIVISION OF AMERICAN RADIATOR COMPANY
40 WEST 40TH STREET · NEW YORK, N.Y.

ALL WHO HAVE SEEN THE NEW ELECTROLUX AGREE:

1935 is GAS REFRIGERATION'S YEAR!

USES NO WATER



Good reason why gas companies the country over are organizing *early* to promote this modern use of gas... taking *full* advantage of powerful Electrolux advertising.

Big new gains were made in Electrolux acceptance with the introduction of air-cooling in 1933. Last year followed through with even greater sales successes... increased popularity for this modern gas refrigerator.

Now with people again in a *real* buying mood . . . and with the new 1935 Air-Cooled Electrolux everywhere acclaimed "the *best*—and *best-looking*—refrigerator of them all," there's strong reason for confidence in the widespread belief that "1935 IS GAS REFRIGERATION'S YEAR."

New Sales Appeals!

For the 1935 Electrolux is a refrigerator that any gas company can proudly offer its customers. Electrolux's distinctive design was created by American women themselves. Its worthwhile modern conveniences set a new high for refrigerator value. And, in addition, Electrolux offers operating advantages that are unmatched.

Every gas refrigerator you install publicizes this eminently modern use of gas . . . builds valuable good will for your company. And it does more! Each Electrolux sold goes a long way to insuring a permanently all-gas kitchen . . . adds 1500 cu. ft. to your monthly load . . . and gives a strong impetus to other gas-using appliances.

Look at these important sales features of 1935 AIR-COOLED ELECTROLUX

NEW BEAUTY
GREATER EFFICIENCY
ADDED CONVENIENCES
FAMOUS OPERATING ADVANTAGES

Today, make your plans for actively merchandising Electrolux in 1935. Get the beautiful new models on display on your floor—in your windows! Remember: *1935 is gas refrigeration's year!* Cash in on it from the start! For sales and merchandising assistance, write—wire—or phone Electrolux Refrigerator Sales, a division of Servel, Inc., Evansville, Ind.

NEW *Air-Cooled*
ELECTROLUX
THE SERVEL *Gas* REFRIGERATOR

1324 Ranges Sold in Month

By C. L. TREVITT

New Business Manager, Community Natural Gas Co., Dallas, Texas

BREAKING all previous range sale records on the Community Natural, Texas Cities, and Stamford and Western gas companies' properties, our November, 1934, range sale, conducted Nov. 1 to Nov. 30, was one of the high points of our year's merchandising activities.

The total of 1324 ranges sold during the campaign represents more than one range per each 100 customers. Completed records on the sale show that 17½ per cent of the sales represent new load taken from competitive fuels, while the remainder are gas replacements.

During the period we featured fully insulated, automatic heat controlled ranges of leading manufacturers. We were stressing the modern appeal of the ranges, and did not feature any particular model or price range as a leader. However, during the campaign, 95 per cent of the ranges sold were table top models.

Potential Market

Determination of potential market was a simple task for this campaign, since for the past three years our system has made an annual appliance survey, which is undertaken the first of each year by division employees. Every home on the system is thoroughly surveyed in this method and the survey files are kept up to date religiously, with purchases and removals noted on the cards as soon as made. Survey cards of new customers are made up at the time of meter setting.

Our advertising carried in daily newspapers during the period stressed the fact that styles in gas ranges have changed since the years when most of our customers bought theirs. In emphasizing the desirableness of the modern gas range, the advertisements pointed out the job the range is expected to do, and explained the features by which it carries out this increased work. The second appeal in advertising was the attractive saving which could be made by buying a range during the sale.

This inducement was based on a special discount on the purchase price, in effect only during the 30-day sale, in addition to regular old equipment allowance. This special price was an attractive inducement which made it possible for us to sell higher type ranges during the campaign.

Coordinated Sales Program

Success of the November sale, we believe, emphasizes the value of the coordinated sales program which our company instituted the first of 1934, with the goal of merchandising modern appliances efficiently over a territory which consists of some 250 towns serving over 100,000 meters. In line with this program, all our salesmen, one to approximately every 3,000 meters, work on a flat salary basis with no extra bonus and no commissions offered.

Our system is divided into 20 divisions, which are further sub-divided into districts made up of from two to 10 small towns adjacent to a larger town designated as district headquarters. Cities of 10,000 meters and over are divisions in themselves.

You haven't a modern gas range if you haven't these four features
... and it's EASY
to own a Modern Gas Range
Special Prices
Trade-In Allowance
Small Down Payment
Easy Monthly Terms
Discount for Cash
Community Natural Gas Co.

Division managers are in charge of sales efforts as well as operations, and are sales managers in effect, under the supervision of the general new business department, just as they are operating managers under the supervision of general superintendents L. B. Denning, Jr. and M. L. Bird. Each division manager has at least one full time salesman to assist in sales work and education. These men have three specific duties: To close their own prospects, assist employees to close contracts and assist the division manager in teaching his organization to become sales minded.

While there was no special bonus offered for prospects turned in by employees, there were six division prizes offered, the winners being based on units per meter sold and installed. These prizes, as won, are paid into the division fund which is used for entertainment purposes for the benefit of all employees in the division or is accumulated and divided, similar to a Christmas fund.

Our sales policy, as shown above, is based on employee selling, every employee, regardless of his or her routine duties, assisting in carrying on load building work. That it is well fitted to our needs we believe is shown by the results of this range campaign, as well as by others during the year. In one small district alone the employees sold a modern range to every 20 meters. In another, the record was one range to every 26 meters. And this was in the face of the fact that the November range campaign was the third contest featuring ranges to be conducted during the year, one having been held in March, the second in June.

A Tip to Salesmen

When a salesman starts out with the idea that he can't, he probably won't. The ladder of successful selling some one has said is: "0%—I won't, 10%—I can't, 20%—I don't know, 30%—I wish I could, 40%—What is it?—50%—I suppose I should, 60%—I might try, 70%I think I can, 80%—I can, 90%—I will, 100%—I DID." So it would seem that the men who succeeded in the past and those who will succeed in the coming months will be those who decide that it CAN BE DONE!

328% Increase in $'s Sales

C. H. Zachry, Vice-President-Treasurer Southern Union Gas Company (Dallas, Texas), furnishes data on a three-months' campaign:

"The principal thing that we have tried to develop is salesmanship in all of our employees; and the campaign was mapped out with this idea in view. None of our District Managers nor Salesmen were offered any prizes, all prizes being given to the employees who were not employed to sell. In other words, those participating in the contest were Service Men, Office Girls, Collectors, Main Line Employees, Maintenance Men, et cetera.

"Prizes were awarded on the basis of the total number of points received by each employee. Points were based as nearly as possible on the gas consumption of the appliances sold. The following schedule was used as a basis determining the total points:

Each New Meter Installation—Five (5) Points.

Unit Heaters
Central Furnace
Conversion Burner
Restaurant Range
—Four (4) Points.

Water Heaters
Circulators
Floor Furnaces
—Three (3) Points.

Space Heaters
Ranges
Refrigerators
—Two (2) Points.

"Points were awarded to the employees who secured and personally contacted prospects resulting in sales, whether or not the employee actually made the sale, our idea being to encourage our employees to go out and actually contact the prospective customers. We also kept a record during the campaign of the contacts made by each employee, but no points were given unless the contact developed into a sale.

"Before our contest started, a complete survey and house to house canvas was made of every gas user and non-user of gas in each town where we operated and all pertinent information secured. From this survey prospects cards were prepared, setting out all such information so that, when the campaign started, a complete list of all the prospective customers was on file in each town. This survey was made by Company employees in each district.

"Practically no extra newspaper advertising was done during this campaign. However, we attempted to make newspaper advertising fit in with our campaign. No extra salesmen were employed during the contest except in two or three towns where we previously had no salesmen at all.

"The campaign lasted through the months of July, August and September, was participated in by several companies affiliated with Southern Union Gas Company, having 10,244 directly connected meters at June 30, 1934, and the following sales were accomplished:

1. 933 New Meter Installations.
2. 460 Water Heaters sold.
3. 368 Ranges sold.
4. 377 Space Heaters sold.
5. 269 Circulator and Floor Furnaces sold.
6. 153 Conversion Burners and Central Furnace Installations.

"Our merchandise sales for this three months period amounted to $85,130.60, an increase of $65,225.12, or 328%, over the same period last year. Our sales for this three months period were in excess of the sales for the calendar year of 1933.

"This type of campaign, at least in our organization, was a new thing and has resulted in building up the morale and self-reliance of our entire field organization; and, we feel that, even aside from the increase in business, the campaign has been a wonderful thing for our operating personnel."

Gas Appliances Feature of Home Modernizing Exhibit

Gas appliances played a leading part in a home modernizing exhibit held recently in Birmingham, Ala., in cooperation with the Federal Housing Administration.

An old house, built 25 years ago, was taken and half of it thoroughly remodeled from foundation to chimney top and the remainder left "as was" in its state of dilapidation and disrepair. The "Half and Half House" was then placed on exhibition for several weeks and was visited by some 25,000 persons. The contrast between the two halves offered a striking example of the need for home renovation.

Half of the exterior of the house was repainted, half of the roof replaced and half of the yard landscaped. Inside, each room was half finished with bright new wallpaper, new floors and new furnishings. The other half was left in all its dankness.

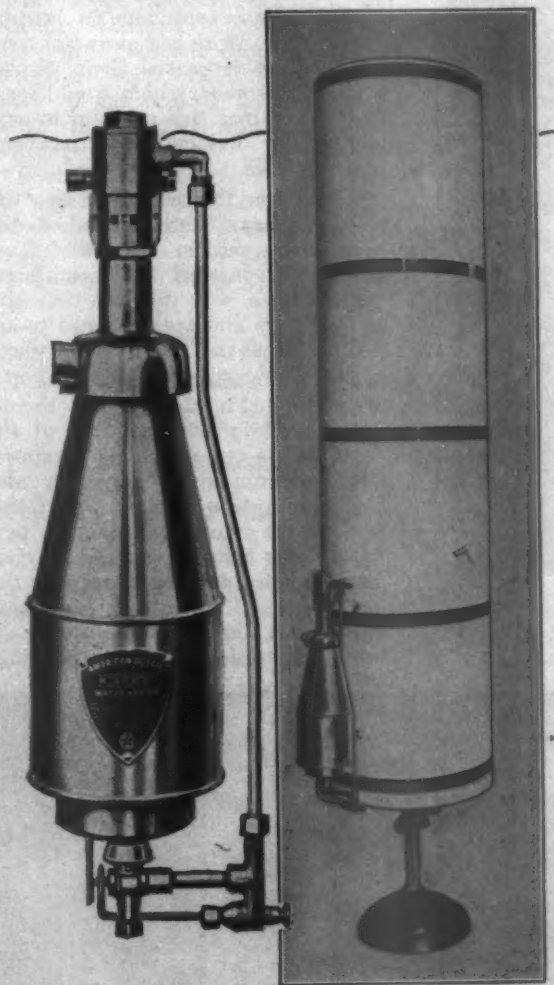
View showing gas range and gas heaters. This is on the remodeled side of the room.

The modernized half of the kitchen included a new automatic gas heater, new range and a new Electrolux refrigerator, the latter not being shown in the pictures. This modern half was repapered and the floors laid with built-in linoleum. The other half was left with the ancient stove, the smoky, torn walls and the black floors. The kitchen with the gas appliances attracted more attention perhaps than any other room in the house.

The appliances for the exhibit were furnished by the Birmingham Gas Company.

Persons visiting the house were asked to register and to indicate any intended purchases for the home. Names of those who planned to buy gas appliances were turned over to Birmingham Gas Company.

A New Wedge for your Spring Drive!



The American-Bosch Konverto is compact... remarkably low in gas consumption and absolutely odorless. American-Bosch insulating jacket is provided for the boiler. This jacket, ready formed of 5 ply, air-cell asbestos, is simple to install, and improves the appearance of the boiler.

Automatic Hot Water...at a new low cost... gives gas companies something to shout about

HAVE you heard about the new automatic water heater that is creating new business for gas companies?

It is the new American-Bosch Konverto—and it is so inexpensive in operation that it is opening up a vast untouched market for gas consumption... bringing the luxury of healthy hot water to homes that could never before afford it.

The American-Bosch Konverto places gas companies in a better position than ever to compete successfully with other fuels... to acquire new customers... to keep present customers permanently sold on gas. Here are just a few of its many advantages:

1. *Economy.* In first cost it is remarkably inexpensive.
2. *Low gas consumption.* Amazingly economical on gas consumption. The Konverto makes old, inconvenient methods unnecessarily extravagant.
3. *Ease of installation.* It converts the old-fashioned manual type of coal and gas heated tank into a modern automatic storage system, with only a minor installation. No pipe or pipe fittings need be used. All connections may be made with tubing.
4. *Automatic operation.* The Konverto requires no attention whatsoever. Its construction is simple and completely automatic.

The American-Bosch Konverto has been so enthusiastically received by the public that many gas companies are planning to feature it in their Spring sales promotions. If you would like to know more about Konverto we will be glad to send you complete information.

American-Bosch, the makers of Kompak and Konverto water heaters, have for years taken pride in creating, designing, building, and selling products superior to those commonly in use. Proven leaders in their fields, these products are built up to a high standard of quality and not down to a price.

Gas Appliance Division

UNITED AMERICAN BOSCH CORPORATION

SPRINGFIELD MASSACHUSETTS

NEW YORK CHICAGO BOSTON PITTSBURGH

NRA CODE

AMERICAN-BOSCH KONVERTO
AUTOMATIC GAS WATER HEATER

Sell Automatic Gas Heat to the "Shirt-Sleeve" Class

By STUART BRATESMAN

Manager, Display Department, Boston Consolidated Gas Company

WITH the general reduction in gas heating rates throughout the country, the progressive gas company can utilize this effective selling theme to boost heating sales. This reduced cost brings gas heating within the reach of the man of average income; in other words, we can now go out and sell the "shirt-sleeve" class.

In planning your heating advertising program for the next year, include an expenditure for window displays. This inexpensive medium will reach hundreds of prospective house heating customers. It is one activity that should be pushed twelve months of the year. If there was any method of actually checking heating sales that were started, and even closed, by effective window display advertising, I venture to say that there would be a big demand for this medium in the industry. As it is, most gas companies are using window displays more than in the past to promote heating sales. The big point to keep in mind is to make the expenditure large enough to really do the job right. Too many companies spend a very little, and then sit back and wait for tremendous returns. This procedure is almost as foolish as spending no money at all, especially in heating advertising. More and more gas companies have increased their display budgets this year, which would seem to indicate that this medium is paying regular dividends in direct and indirect sales.

Shown on this page are two examples of gas heating window displays that appeal to the man of average income, instead of the rich man. Both angles sell the subject with spoken copy and both attempt to actually address the "shirt-sleeve" class.

There is a chuckle behind the display designed around the lazy theme. The expression and attitude of the "subject" is one of universal appeal and understanding. The copy also carries out this natural dislike for labor in any form. One line, "perhaps that's why I changed to Gas Heat," forms the complete sales tie-in. No need for rambling equipment advantages, here. Gas heating is brought into the picture on the wings

of a good laugh, not forced down the reader's throat in the form of a monotonous list of features.

The other display is self-explanatory, in that it presents the story in logical terms and even goes so far as to show a modern young man in his shirt-sleeves, as a quick tie-in with the theme in question.

You will notice that neither of these displays show the actual heating appliance. Photostatic enlargements are used to give the reader a rough idea of what the boiler looks like. The main purpose of these advertisements is to attract attention, through their human-interest and "shirt-sleeve" appeals. It's up to the heating salesman to carry out the story with complete details, surveys, estimated costs, etc. A successful piece of gas heating display advertising should only arouse interest, nothing else.

Give this "shirt-sleeve" angle a try in your next set of house heating window displays. It's another interesting variation of the gas heating story that will bring gratifying results.

WORLD 5 RECORD BREAKERS
MODERN
GAS RANGES
OUTSTANDING FEATURES OF MODERN GAS RANGES
are fully equipped with Automatic Clocks and other similar devices, but actual use in the home has proven, definitely, that women "Cook in the Kitchen" and the time-saving factor of GAS is unquestionable.
More Than 1,000,000
Gas Ranges Sold in U. S. in 1934
As Low As $59.50 Cash
Terms As Low As $2.50 a Month
Many Local Dealers Will Gladly Show This Gas Appliance.

Recent advertisement of Nashville, Tenn., Gas and Heating Co.

Salesman's Survey Card

THE card reproduced herewith is one used by the Minneapolis, Minn., Northern Power Company for their salesmen.

Addressograph meter plate is used in blank space at the top. This method gives names of all gas users on a street.

Cards are made out when the meter is set, one for the master file at the division office and one for the salesman covering the territory.

File is kept by streets to concentrate calls and if a new salesman takes over the territory a new set of cards is made up, so that remarks or notations of failure to close are not inherited by the new man.

As a rule a new set of cards is made up each year by each salesman. The tab corresponding to the number before each appliance is cut off as soon as the appliance is sold, thus the remaining tabs are always prospects.

1 2 3 4 5 6 7 8 9 10 11 12

HEATING INFORMATION

BLDG. USED FOR — SIZE

CONSTRUCTION — NO. OF ROOMS

STORM SASH — WEATHERSTRIP

BASEMENT

NO.	APPLIANCE	USE	INT.	DATE PURCHASED	REMARKS
1	FURNACE				
2	BOILER				
3	CONVERSION				
4	THERMOSTAT				
5	ROOM HEATER				
6	RADIANT HEATER				
7	GARAGE HEATER				
8	RANGE				
9	WATER HEATER				
10	INCINERATOR				
11	REFRIGERATION				
12					TERRITORY NO.

Salesmen's Compensation

"We adopted a plan, beginning August 1st, agreeing to give as a bonus to our employes, all profit earned on appliance sales, payable in June and December. In addition to the salesman's salary, and commission, we pay 5% on all money collected with contract, at the time of the sale. The plan so far is working as we find we collect more cash with our orders and make more cash sales.

"Our plan of permitting our unemployed consumers to work out their gas and merchandise accounts has created considerable good will in our territory. We confine all our extra work to unemployed gas consumers. The Illinois Gas Co., Lawrenceville, Ill.

Operating Division of N. E. G. A. Holds Annual Meeting

By STAFF CORRESPONDENT

THE Annual Operating Division meeting of the New England Gas Association opened in Boston, Mass., at 6:30 P. M. Friday, January 11, 1935. A dinner attended by more than 80 members and guests preceded the formal meeting.

Chairman R. S. Carter opened the meeting by calling upon David R. Campbell, Secretary of the N. E. Gas Association, to summarize the year's activities of the operating division. The keen competition between the various sections is an outstanding feature of the N. E. Gas Association and produces much of benefit for those attending.

Then followed the election of officers of the operating section for the ensuing year.

Mr. F. M. Goodwin, President of N. E. Gas Association was eloquent in his praise of the operating division for its numerous activities and high standard of the presentations during the year.

Mr. Carter spoke of the cooperation he had received from officers and members during the year and appealed for more ideas.

Mr. Erick Larson's paper, "The Engineer's Place in Today's Picture," reproduced in another part of this issue, brought out some interesting facts on the present day status of the engineer.

Peak Load Problems

In his paper on "Increasing Plant and Distribution Capacity for Peak Loads," Mr. H. W. Schell, Supt. of the Haverhill Gas Light Co., described some unique methods by which plant capacity was increased with a comparatively small capital outlay. He brought out how often cooler capacity was increased by prevention of air binding which a study indicated to exist. Where exhauster capacity was limited by the pressure imposed on the exhauster outlet, a supplementary exhauster could be installed between the purifiers and the holders. The difficulties of synchronizing this exhauster with the initial exhauster ahead of the scrubbers and coolers had been minor and easily overcome. The supplementing exhauster is used only during periods of peak manufacturing demands which occur infrequently during the year.

Handling Appliances

J. L. Johnson, Sales Manager at Providence, read Mr. A. D. Hiost's paper on "Handling Enameled Appliances." Mr. Hiost is Purchasing Agent for the Providence Gas Company. Most ranges are today delivered by truck and truckmen dislike to wait for an inspection. However, Mr. Hiost described a method of inspection by the storeroom immediately following delivery with the truckman present, which has increased the care with which truckmen handle ranges. Care in handling is particularly valuable in minimizing cracking, chipping and spoiling after a range has been in service. Careless handling may result in an injury only apparent after several heatings of the range. A complaint of faulty enamel after a range has been used is particularly difficult to settle as there is seldom a clue to the cause. He described a method of setting each range in the storeroom on a lift truck, thereby minimizing touching ranges with hands.

Mr. R. B. Wright of the Glenwood Range Company, read a discussion on Mr. Hiost's paper by Mr. Malcolm Leach, Sales Manager of his company. The extreme care taken by manufacturers to assure a perfect finished enamel product was described. After treatment of the metal surfaces even the touch of a hand may cause an imperfection in the finished product. Coating has been intensively studied by manufacturers and a decided decrease in shipping damage noted. The use of extra heavy material in the crates was long considered advisable to resist impacts during shipping. Shippers, however, assumed the heavy crates would stand rough handling and took no precautions. The use of light materials for constructing the crates lessened the damage. Enameled ranges were originally wrapped in paper before crating. Putting the wrapper so handlers could see the nature of the goods still further decreased damage in transit.

The meeting was then opened for discussion of the papers during which many interesting questions were asked.

The Saturday morning session was opened promptly at 9:30 A. M. by Chairman R. S. Carter.

Jacking a 48" Pipe

Mr. C. S. Beaudry, Engineer of Malden and Melrose Gas Light Co., presented a paper illustrated by slides on "Jacking a 48" Pipe Under a Railroad Main Line." The purpose of the installation was to provide a duct through which steam, water and electric lines could be run from the plant across the main double tracked line of the B. & A. railroad a distance of approximately 75 feet to the holder station. Railroad records were searched to determine the nature of the fill and thickness of a concrete retaining wall on the plant side, but the records were incomplete. The first difficulty was that the retaining wall at the duct level was found to be 7 feet thick. The fill encountered initially was cinders. After jacking the duct approximately 20 feet further effort crushed the pipe. However the 20 feet driven brought the front end close to the first track and an open cut was made exposing the section driven. The railroad objection to all open cuts was overcome by pushing a section for a distance of 35 feet, the fill having changed in character to one more adaptable to driving. The driven section cleared the tracks and the remaining section was installed by an open cut.

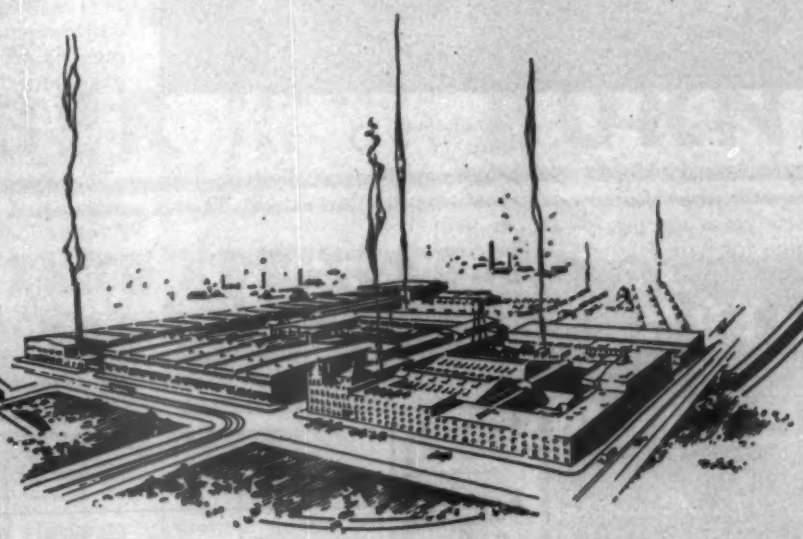
The pipe used was galvanized, corrugated steel. On exposing the first driven section the galvanizing was found to be in excellent condition justifying the selection. Corrugated pipe was selected due to its higher total strength compared with plain steel of the same wall thickness.

(Continued on page 56)

BARTLETT HAYWARD

A complete organization—the result of years of pioneering and aggressive leadership in the American Gas Industry—is eminently qualified to assume the responsibility, from start to finish of any project you may be contemplating.

A well rounded, completely equipped organization with
UNDIVIDED RESPONSIBILITY
gives you assurance of economy.



THE BARTLETT HAYWARD CO.

BALTIMORE, **FOUNDED 1832** **MARYLAND**

Coal Gas, Carburetted Water Gas, Blue Water Gas, By-Product Plants—De Brouwer Charging and Discharging Machines—Waste Heat Boilers—Purifiers—Tar Extractors—Condensers—Feld Scrubbers—Safety Check Valves—Fast's Couplings—Tanks—Dry and Water Seal Holders

100 YEARS OF SERVICE TO INDUSTRY

Gas Hair Dryers a Profitable Gas Load

Typical Beauty Parlor Installation

THERE are approximately 57,000 beauty parlors in the United States. Up to a few years ago practically every machine for hair drying was operated 100 per cent by electricity. Now a number of companies are building hair drying apparatus using gas as a fuel with great economies in operation to the beauty parlor owner, and a constantly increasing load for the gas company.

A beauty shop using a gas hair dryer is a powerful and practical argument in favor of gas. Every woman will know that this task was formerly performed by electricity. She will be sure to notice that the gas dryer is automatic—the operator has only to turn a switch to start the flow of warm air. The speed of operation and the fact that the drying process did not raise the temperature of the room will immediately impress her. The favorable reaction of this woman to this modern and efficient appliance cannot help but go a long way toward overcoming any doubts she might have as to the desirability of using gas for cooking, water heating and house heating.

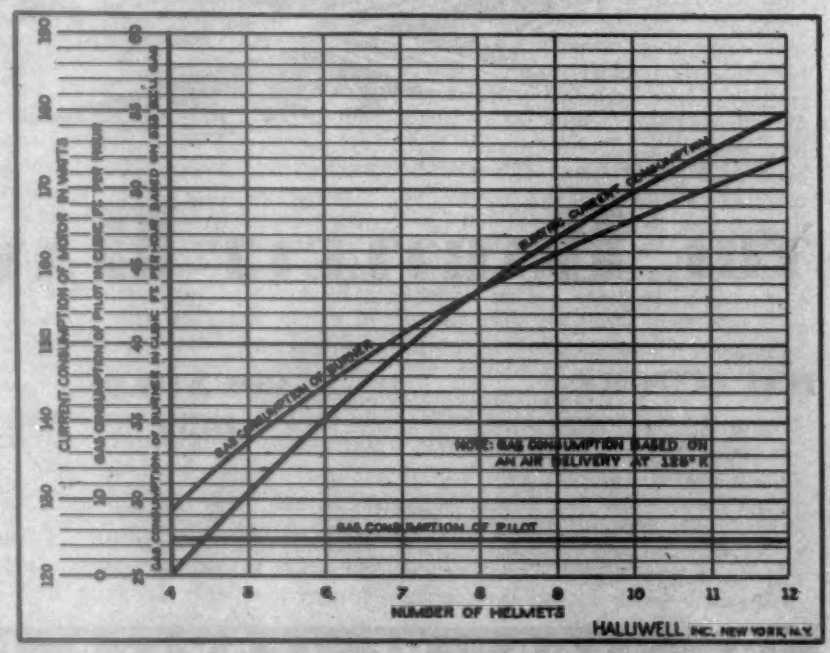
The gas consumption of a gas dryer varies with the number of helmets in operation. A four helmet system dryer, delivering air at 150°F. consumes about 30 cu. ft. of 540 b.t.u. gas per hour, whereas a 12 helmet machine at the same air temperature consumes about 52 cu. ft. per hour.

The cost of operating the gas fired dryer as compared with the all electric hair dryer runs from 40% to 50% less for the gas dryer.

Practically every beauty parlor now uses gas for heating marcel irons, etc. Therefore the installation of gas hair dryers does not add any overhead expense to the gas company but they will increase the gas load from 1000 to 1500 per cent.

The desirability of this gas load is now being considered by many gas companies. The Dallas Gas Co., Dallas, Tex., announces that owing to the interest in gas hair dryers expressed by the jobbers of beauty shop supplies in Dallas, the gas company is arranging for a display and demonstration of this equipment in the auditorium of the Dallas Gas Company during the days and evenings of February 4th and 5th. The jobbers will be assigned space and the gas company will see that the equipment is properly connected so far as gas connections are concerned. All beauty shop proprietors in Dallas and surrounding territory will be invited to attend the demonstration.

The chart and cut shown are by courtesy of Halliwell, Inc., 100 Sixth Avenue, New York. Their De Luxe Gas-Electric System Hairdryer is equipped with a small motor, a Barber safety pilot gas burner and is thermostatically controlled, which insures uniform heated air to the drying helmets.



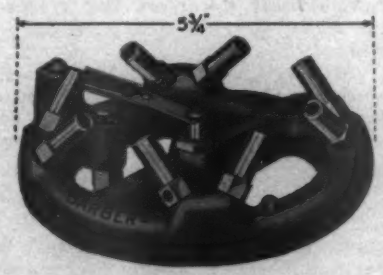
Comparative Consumption Chart

. . . . *Here's A Load-Building Suggestion!*

AGGRESSIVE Gas Companies now realize the necessity of developing more business from *new fuel users.* A few typical appliances through which the consumption of gas may be extended are listed below. There are of course many others.

With this purpose in mind, the Barber Gas Burner Co., Gas Burner Specialists, have developed an absolutely new line of burners for commercial purposes. Each of these new Barber units (of which there are six models, in several sizes) is specifically designed *for its own purpose.* A feature of utmost importance is that each unit is equipped with fully Automatic (built-in) Safety Pilot Control.

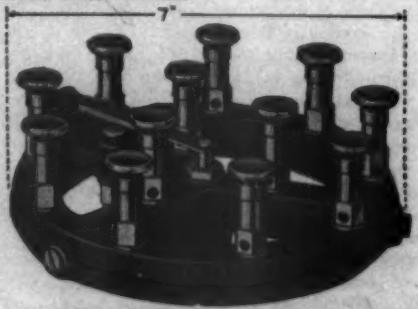
Furthermore, when Gas Companies encounter difficulties through the use of imperfectly designed or unsuitable burners in appliances which the Gas Companies help to merchandise, we suggest that such appliance manufacturers be put in touch with the Engineering Department of the Barber Gas Burner Co. The co-operation of both Gas Companies and Manufacturers is invited. Write for Illustrated Bulletin No. 1234A.



No. S.P-15 Barber Burner with Safety Pilot

Space Heaters — Steam Tables
Sterilizers — Water Heaters
Coffee Urns — Floor Furnaces
Garage Heaters — Hair Dryers
Banana Room Heaters
Circulating Heaters
Clothes Dryers — Coffee Roasters

THE BARBER GAS BURNER CO.
3704 Superior Ave., Cleveland, Ohio



No. M.P-12 Barber Burner with Safety Pilot

BARBER *Automatic Jet Gas* BURNERS

IF YOU KNOW NEW YORK YOU KNOW THE

Convenient to the places where smart, eager people want to go, the Hotel Montclair is well known and liked by New Yorkers themselves.

Here is a good place to dine—to dance—to meet friends as well as to stop when coming from out-of-town. The leading Fifth Avenue shops, Radio City and the Broadway theatres are within walking distance. In bad weather, you can use the convenient buses for almost any place you want to go.

The cost of the beautifully appointed, comfortable rooms at the Montclair is indeed moderate for New York.

800 outside rooms with Bath, Shower, Radio
SINGLE from $2.50
DOUBLE from $3.50
RESERVATIONS ARE RECOMMENDED

In the new smart center of New York

EQUIPMENT NEWS

Two New Products of Pittsburgh Equitable Meter Co.

The Pittsburgh Equitable Meter Company, Pittsburgh, Pa., has developed two products of interest to gas men who are merchandising the Servel Electrolux Refrigerators, the EMCO Safety-Seal Pressure Regulator and the EMCO Flow Indicating Meter.

The EMCO Safety-Seal Pressure Regulator fills the need for a small compact gas pressure regulator for gas refrigerator installations where it is impossible to run vent lines to the open air.

Two diaphragms are incorporated in the design of this regulator. In the event of control diaphragm failure or seepage through the control diaphragm, the gas flow is automatically cut off through the medium of the second diaphragm. This regulator, in addition to the safety feature, gives very accurate pressure control and is subject to simple and easy adjustment.

The EMCO Flow Indicating Meter provides an accurate instantaneous reading of small rates of flow in actual cubic feet per hour. It is indispensable in setting Servel Electrolux Refrigerators, adjusting pilot lights, studying leakage, etc.

Emco Flow Indicating Meter

Emco Safety Seal Regulator

Through use of the EMCO Flow Indicating Meter rate of flow is shown instantaneously without the necessity of timing or computation.

Bulletins describing these two appliances in detail and giving prices may be had by writing the company.

New Tinnerman Gas Range

Tinnerman Stove & Range Co., Cleveland, O., announce their new Streamline model gas ranges. The illustration shows the regular utility model, which has an overall size of 22" x 40". The four burners are arranged in line across the back of top, the remaining space providing a convenient table top for the preparation of meals. The burners are of a new type, non-clogging, and two burners are equipped with automatic simmer flame controls. Concealed behind the door on the left side of the stove is a large utensil compartment, and on the back of the door is a rack for pot covers. Oven and broiler are to be found on the right-hand side.

New Tinnerman Gas Range

It has a new type "piano stool" rotary broiler that can be raised or lowered without stooping. They are equipped with heat regulator, a condiment set, lamp and automatic timer.

Introduce "Numerals in Colors" for Multiple-Point Recording

Reading of multiple-point instrument records is greatly simplified by a new system of "numerals in colors" introduced by Leeds & Northrup Company, Philadelphia. This marking system can be specified on Micromax strip-chart recorders for 2, 3, 4 or 6 points. With each of the thermocouples, resistance thermometer bulbs or other primary elements identified on the chart by a numeral, and each numeral distinguished from the others by being printed in a contrasting color, reading of records is made easy, errors are avoided and time is saved. Colors used for printing the numerals are: black, green, red, violet, yellow and blue.

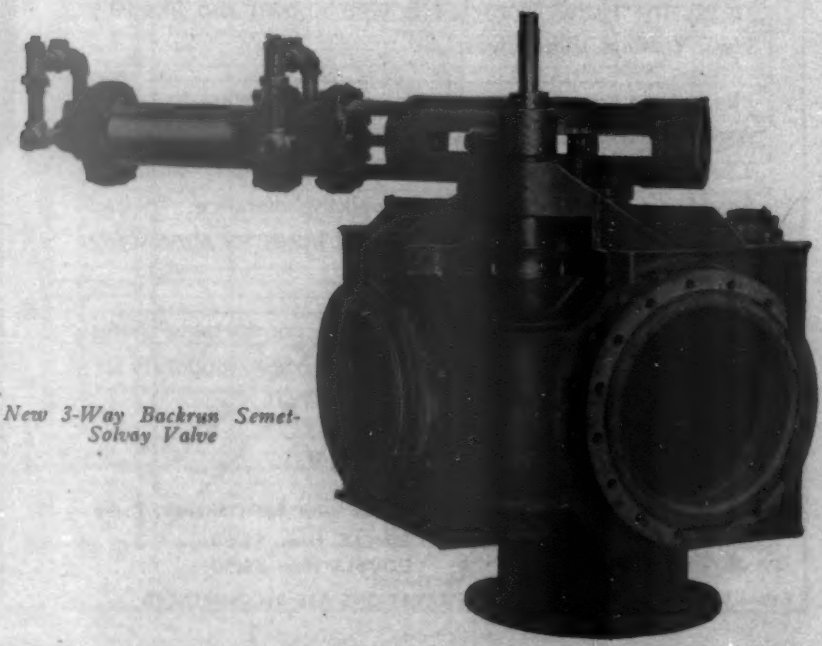
The print-wheel on these Micromax Multiple-Point Recorders has a separate inking pad for each point to be recorded.

A circular giving further details and showing a reproduction of an actual chart in all six colors will be sent on request. Address the above Company and ask for Circular No. 314-I.

New 3-Way Backrun Valve

Semet-Solvay Engineering Corp., 40 Rector St., New York, announce a new 3-Way Backrun Valve for water gas machines. It is designed to meet the more exacting demands that come with heavy oil carburetion.

A quick opening door, full height of the box, allows easy access for inspection, cleaning, and replacement of any watering parts. It has dish welded steel discs, and disc seats are removable. It has two large bearings always in alignment, one above the box and the other partially outside, both cooled by radiation. An adequate spray system reduces carbon and tar accumulations when running on heavy oil. They are built for any size and type of water gas machine.



New 3-Way Backrun Semet-Solvay Valve

Gas Fuel Unit Saves Its Cost in Three Years

THE Dickson-Jenkins Company are makers of high-grade work clothes and sport garments in Ft. Worth, Texas, employing some 400 workers and using 350 motor-driven machines, not to mention their requirements of current for lighting and elevator service. They were paying never less than $325 and sometimes as much as $500 a month to the local light and power company. They believed they could do better. Accordingly, in 1932, a 3-cylinder gas engine and an alternating-current generator were installed, with the result that the monthly bills for power now average $117. The monthly saving, as reckoned by responsible officers of the company, is $240 to $260 a month, at which rate the investment involved would be cancelled in about three years. The figure of present cost, $117 a month, is made up of fuel, $94; lubrication, $8; and water, $15. It includes no labor charge because the time devoted has been only about one man-hour a day and the two general repair men regularly employed have been able to afford that without any hardship or neglect of other duties. There have been no repairs or replacements needed and it is not likely that any will be called for in the near future. Therefore, on an outfit that owes the company nothing, it has not seemed necessary to enter into any analysis of depreciation. Neither, on the other hand, does the quick comparison just given take account of the fact that the working force has been enlarged, that new machines have been added increasing the motor load by twelve horsepower, and that the costs if the former method were still followed would have gone up, accordingly.

The installation adopted was a Cooper-Bessemer 4-cycle vertical gas engine of 3-cylinder type with 11½-inch bore and 14-inch stroke, and a General Electric alternating-current generator with a direct-connected exciter, the engine being harnessed to the generator by a V-belt drive. The engine, though designed for normal rating of 135 horsepower at 360 r.p.m., was reduced to 110 horsepower at 330 revolutions, which was adequate for all anticiptaed needs. The plant operates 8 to 10 hours daily—on double shift it would show even better economy. The natural gas used as fuel costs 50 cents a thousand for the first hundred thousand cubic feet, 30 cents for the next hundred thousand, and 25 cents for all additional consumption.

Mr. P. Jenkins, Vice President of the Dickson-Jenkins Manufacturing Company, vouches for the correctness of the statements of fact here given and is very enthusiastic over the experience of his company in commanding its own source of power.

Cooper-Bessemer installation in Dickson Jenkins Factory

A SIGNIFICANT STATEMENT

OFFICERS

L. J. Brown, Chairman
Wayne Stacey, President
Paul C. Rodgers, Executive V. P.
R. B. Luebbe, V. P. and Chief Engineer
W. S. Guitteau, Vice President
A. E. Harvey, Sales Engineer

THROUGHOUT the depression *this* sound old company has continued *without interruption* its high type of service to users of gas holding and purifying equipment. This is a fact of *real significance* for the careful purchaser of this type of equipment. Let us quote you on famous Stacey-Klonne Dry Seal Holders, Telescopic Holders, or Stacey Bullet High Pressure Holders, Purifiers, Tanks and other plate work.

STACEY BROTHERS GAS CONSTRUCTION CO.

STACEY-KLONNE GAS HOLDERS
TELESCOPIC HOLDERS

Cincinnati, Ohio

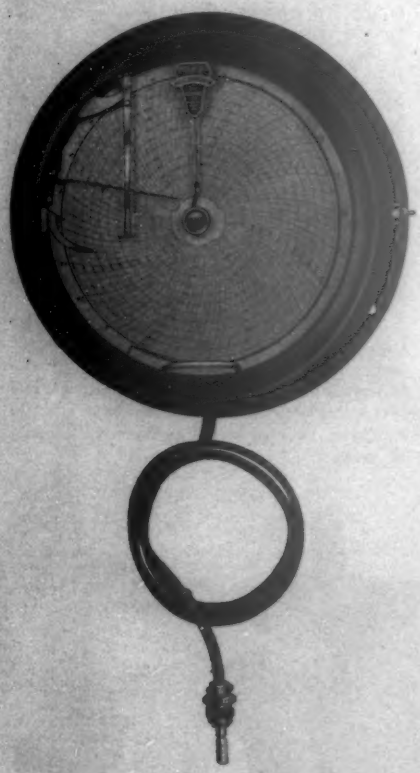
"STACEY BULLET" HIGH PRESSURE HOLDERS
PURIFIERS

NEWS of the GAS INDUSTRY

Foxboro "Anti-Ambi" Thermometer

The Foxboro Co., Foxboro, Mass., in Bulletin 178 describes the Foxboro "Anti-Ambi" thermometer for gas temperature measurements. This thermometer is not affected by the changes in temperature surrounding the case and tubing, thus eliminating all possibility of error due to ambient temperatures. It is fully compensated and accurately records temperatures up to 250 degrees.

It is designed with two identical thermal elements except that one is without a bulb. The compensating element merely resets the recording element with every change of ambient temperature—one carries the other. There is *no opposing action*. The compensating element is merely an automatic zero setting device. This results in an *accurate* bulb temperature reading. The same filling and the same ratio of volumes is used in both elements.



In this design there are no cams, compensating levers, bi-metallic strips, nor retarding, detent, or opposing action of any kind.

They state that for extreme accuracy under abnormal conditions there is no long-distance thermometer that will answer the purpose as well as the "Anti-Ambi."

A copy of Bulletin will be mailed on request.

To Reorganize

The Indiana Utilities Corporation of Corydon, Ind., a natural gas distributing company, has filed a petition in the Federal court in Indianapolis seking to reorganize. The company went into receivership three years ago.

New Gas Rates at Tipton, Ind.

New gas rates for Tipton, Ind., became effective Jan. 2. The reductions were made by the Indiana Public Service Company. The old complicated schedule of rates was abolished and a simple two-rate schedule, one for residences and one for business and industrial establishments, was substituted. Although the minimum charge remains $1 a month, the price for the first 2,000 cubic feet of gas now is $1.60, a reduction of about 10 per cent. For the third, fourth and fifth thousands of cubic feet the rate will be $1 a 1,000. For commercial purposes the first step is $1 a 1,000 for the first 8,000 cubic feet. Similar rates will apply to Noblesville, Cicero, Atlanta and other localities served by the same company.

Gary Electric and Gas Co. Reorganized

Reorganization of the Gary Heat, Light and Water Company's holding company, the Gary (Ind.) Electric and Gas Company of Delaware, recently was completed in Indianapolis when directors and officials met and made effective a new plan of operation approved last October in the United States district court in Chicago.

The reorganization was effected under section 77-B of the new federal bankruptcy act. Cardinal feature of the plan is extension of 10 years, or until July 1, 1944, of the maturity date of $8,000,000 of the Delaware company's first lien, collateral, 5 per cent gold bonds. This issue fell due last July 1, but the company was unable to retire it. Thereupon a reorganization was sought, with the sanction of nearly all the shareholders.

The 5 per cent rate of interest will be continued through the extended period and a sinking fund created for purchase of bonds an issuance of stock certificates for each $1,000 bond. Holders will be able to exchange these certificates for 15 shares of the company's stock without cost, according to John N. Shannahan, chairman of the directors.

1935 Edition, A.S.H.V.E. Guide

The 13th edition of "The Guide," published annually by the American Society of Heating and Ventilating Engineers, has just been released.

Though the Guide Publication Committee has produced a new book, it has retained from the older ones those data which are basic and fundamental and it has made additions and changes to cover new developments in both theory and practice. More than 200 engineering specialists have helped in the preparation of The Guide, 1935. This work of the members and sub-committees has been correlated and edited by the Guide Publication Committee: Walter L. Fleisher, Chairman; John Howatt, Prof. G. L. Larson, Samuel R. Lewis, E. N. McDonnell, Prof. W. M. Sawdon, and J. H. Walker, with J. L. Blackshaw as technical assistant.

The Guide, 1935, has three divisions: The Technical Data Section, pages 1 to 706, is a reference book and text, which in its 41 chapters covers the fields of heating, air conditioning, cooling, insulation and ventilation in their theoretical and practical aspects. Starting with factors fundamental to heating and air conditioning—air properties, air distribution, ventilation requirements, heat transmission co-efficients of materials and of various structures—it carries on through discussions of the many types of heating, cooling, and conditioning needed, with their applications and methods of accomplishment. It here treats of systems of heating, cooling, and air conditioning; of fuels; of apparatus and machinery; of test methods and instruments.

A chapter on sound control considers the theory and practice of insulating against sound and automatic control devices are fully covered. The machinery and instruments needed for the devices and systems discussed are described in detail. The concluding chapter gives abbreviations, values, symbols and conversion equations for the terms used in this text and related ones.

Wholly new this year in addition to an inserted psychrometric chart is the section called Problems in Practice which supplement Chapters 1 to 40, in the form of questions and answers relating to the material presented. These practical treatments summarize each chapter in an interesting and instructive way, and it is felt that this added feature will prove of great value to users of The Guide. A more comprehensive index to the Technical Data Section has been made in order that references may be more quickly checked in the text.

There are 1024 pages in The Guide, 1935, which bound in a flexible red cover, 6 x 9 inches in size, can be obtained from the American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York, N. Y., at a cost of $5.00 per copy.

Record Appliance Sales in 1934

Brooklyn Union Gas Co., Brooklyn, N. Y., report retail sales of gas appliances in 1934 of $1,519,899.22 which is $50,812.85 over the previous all time record established the previous year.

The most outstanding feature of the company's appliance business in 1934 was the steady rise in dealers' purchases. In nine of the 12 months they were above those for the same months the previous year, and the aggregate for the year, $651,838.96, was $71,140.87 above the highest total previously attained.

SUPERIOR

Gas Meters
Provers
Service Cleaners
Diaphragms
Repairs

SUPERIOR METER CO.
167-41st Street
Brooklyn, N. Y.

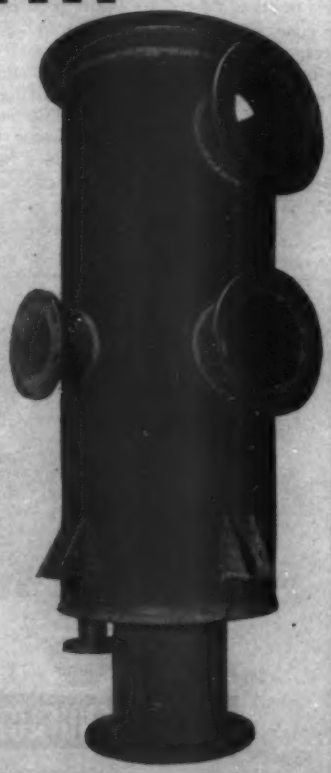
CRAFTSMANSHIP

IN THE BUILDING of pipe systems, requiring fittings of complicated design and fabrication Semet-Solvay manufacture is marked by the highest type of craftsmanship obtainable.

SPECIALLY designed machinery, existing in no other shops, cuts sheets or tubing accurately to specification, permitting perfect welding and resulting in even, smooth, strong seams.

WITH YEARS of experience in the building of piping, tanks, stills, shells, and other plant equipment, Semet-Solvay has perfected standardized production methods, flexible enough for every construction job.

USE THESE facilities when planning or buying your apparatus. They insure long service, a minimum of maintenance, true economy and satisfactory operating results.



SEMET-SOLVAY
ENGINEERING CORPORATION

40 RECTOR ST. **NEW YORK, N. Y.**

Statement by John J. O'Brien, Pres. Standard Gas & Electric Co.

In a statement prepared by John J. O'Brien, President, Standard Gas & Electric Co., Chicago, Ill., he outlines the plans for improvements and extensions of service by his company, and touches on a few of the problems confronting the industry. The statement in part follows.

"Improvement over a year ago is sufficiently evident so far as volume of business is concerned to justify in 1935 a policy of aggressive load building by companies in the Standard Gas and Electric Company system. Such expenditures as seem advisable for improvements and extensions also will be made in a spirit of confidence as to the future, since these companies are rendering efficient service at reasonable rates and have the good will of their customers. Public utility companies in the system are important elements in the prosperity of the communities they serve, and are actively backing all business recovery efforts of a local nature including the modernization drive now under way directed by the Federal Housing Administration. Executives of our various companies express keen interest in the concerted efforts being made to stimulate business revival, believing that these efforts will be a leading factor in the improvement that has been predicted for 1935.

"It is in the belief that public utility companies can and should be leaders in business recovery that extraordinary efforts will be made by the Standard Gas and Electric Company group to increase the use of their services in the new year. Unquestionably the great amount of unfair political criticism directed against the electric utilities has had a hampering effect, and the more it is persisted in the more damage to the general economic structure will be done by impairing the progress of a key industry. The nature of utility services is such, however, that, to a certain degree, it continues to be improved even under adverse conditions. Perhaps because utiilties must wage an unceasing battle with the forces of nature, and are rendering constantly better service despite lightning, hurricanes and floods, they will in the long run be strengthened by having to fight their way against political storms as well. Right now, however, it appears that proponents of recovery should treat the industry not as an enemy, but as an ally, and should adopt a policy of conciliation and cooperation rather than one of opposition. It has burdens enough without government competition, which with increasing taxes and rising costs, threatens to more than offset the benefits derived from increased business."

Gas Refrigeration "Prosperity Contest"

Plans for a nationwide gas refrigerator sales campaign under the sponsorship of the American Gas Association Refrigeration Committee during April, May and June of this year were approved at a meeting of the Committee held here on January 7, at the A.G.A. headquarters in the Graybar Building. The meeting was called by John J. Quinn of the Boston Consolidated Gas Company, 1935 chairman of the Refrigeration Committee.

The forthcoming Spring campaign to be known as the "Prosperity Contest," will be conducted on a much larger scale than that of the "Go-Getter Contest" in the Spring a year ago when six blue vases were bestowed as trophies to winning gas companies in addition to cash awards, it was announced after the meeting.

Speakers at the meeting referred to the "blue vase" contest in 1934 as "the most stupendous campaign ever conducted by the gas industry," and predicted that "this new 1935 campaign will be better and greater than anything hitherto attempted." Announcement was made that "hundreds of prizes will be awarded for the sale of Electrolux refrigerators during the months of April, May and June in the present year."

The Refrigeration Committee had sent out to all A.G.A. gas company members to reserve the period from April 1 to June 30 for the "Prosperity Contest."

Convention Calendar

February

14–15 New England Gas Association, annual convention, Hotel Statler, Boston.

14–15 American Gas Association Mid-West Regional Gas Sales Conference, Hotel Sherman, Chicago, Ill. W. L. Jones, St. Louis County Gas Co., Webster Groves, Mo., chairman. A regional Home Service Conference will follow the sales conference on Saturday morning, February 16.

14–15 Conference on electric and oxy-acetylene welding, Texas Technological College, Lubbock, Tex. Address inquiries to Prof. H. F. Godeke.

20–22 American Gas Association Southern-Southwestern Regional Gas Sales Conference, Dallas, Tex. W. A. Hudson, Birmingham (Ala.) Gas Co., chairman.

February-March

28-1 American Gas Association Eastern Natural Gas Sales Conference, William Penn Hotel, Pittsburgh, Pa. W. L. Hutcheson, Manufacturers Light & Heat Co., Pittsburgh, chairman.

April

15–17 Mid-West Gas Association, annual convention, Hotel Fontenelle, Omaha, Neb. R. B. Searing, sec., 302 Utilities Building, Sioux City, Ia.

25–26 Missouri Association of Public Utilities, annual convention, President Hotel, Kansas City, Mo. N. R. Beagle, sec., 101 West High St., Jefferson City, Mo.

May

2–3–4 American Gas Association Distribution Conference, Hotel Cleveland, Cleveland, Ohio.

6–9 Natural Gas Department, American Gas Association, annual convention, Hotel Peabody, Memphis, Tenn.

7–9 Pennsylvania Gas Association, annual convention, Skytop Club, Skytop, Pa. F. W. Lesley, secretary, York, Pa.

13–15 American Gas Association Production Conference, Hotel New Yorker, New York, N. Y.

June

10–11 Canadian Gas Association, annual convention, Quebec, George W. Allen, secretary, 21 Astley Ave., Toronto, Canada.

October

14–18 American Gas Association, 17th annual convention, Atlantic City, N. J. Alexander Forward, managing director.

GAS SERVICE STOPS
SINCE 1869 Hays has built dependable brass products for the Gas Industry. Standard Special Weight, Heavy Pattern and High Pressure Stops to meet all requirements are manufactured by Hays in a full range of sizes. Write for Catalog No. 4 today.
HAYS MANUFACTURING CO. ERIE, PA.

STANDARDIZE

on

SPRAGUE
CAST IRON GAS METERS

and

REGULATORS

for

low, medium, and high pressures

Accurate in Measurement.
Economical in Service.

THE SPRAGUE METER CO.

BRIDGEPORT, CONN.

"Using CHACE Exclusively"

WATERS-GENTER CO.
Minneapolis . . . Minn.

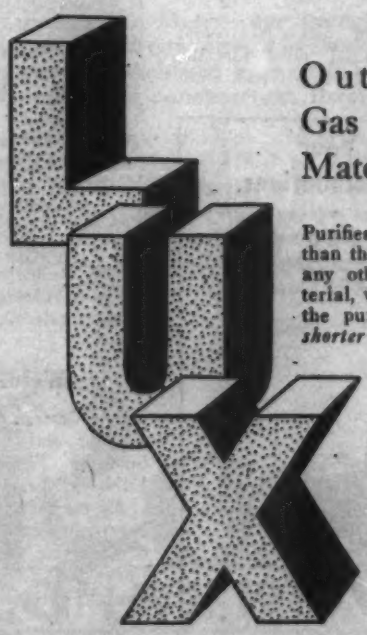
TOASTMASTER
HOSPITALITY Tray
BREAKFAST Tray

CHACE THERMOSTATIC BIMETAL
"It Bends with the Heat"

Chace Thermostatic Bimetal is used in many electrical appliances to automatically operate switches and controls. The Gas industry depends upon Chace for many automatic movements and safety controls. Heating and Air Conditioning is also largely dependent upon Chace Bimetal to regulate temperature and for automatic working of important units.

Sold in Sheets, Strips and in Shapes formed to your specifications.

W. M. CHACE VALVE CO.



The Outstanding Gas Purifying Material » » »

Purifies *much more* gas than the same quantity of any other purifying material, while it also effects the purification in much *shorter time.*

Write for interesting booklet

THE ALPHA-LUX COMPANY, Inc.
192 Front St., New York

Philadelphia Chicago

Personals

Sidney J. Ratcliffe has been appointed treasurer of The Peoples Natural Gas Company and the Columbia Natural Gas Company, Pittsburgh, Pa., it was stated by Mr. J. B. Tonkin, president.

Mr. Charles H. Rupp, retiring treasurer, is completing 32 years service. Mr. Ratcliffe has been with the company 22 years. For the past two years he has been assistant treasurer after a number of years as chief clerk.

Mr. Oscar H. Graf is first assistant treasurer. H. Donald Borger has been made an assistant treasurer, a promotion from chief clerk.

Dr. Carleton B. McCulloch has been elected a member of the board of trustees of the Citizens Gas Company, Indianapolis. The following directors also were elected at the trustees' meeting: J. I. Dissette, G. A. Efroymson, Edgard H. Evans, Walter B. Harding, H. H. Hornbrook, William H. Insley, C. L. Clerk, Reginald H. Sullivan and Franklin Vonnegut. All directors were re-elected.

James P. Hanlon has been appointed sales manager of gas appliances of the Pub. Serv. Elec. & Gas Co., Newark, N. J. Mr. Hanlon has been in continuous employ of Public Service and predecessor companies since 1893. Public Service Electric & Gas began on Jan. 2nd, to designate the new Business Department as the Sales Department.

James C. Sackman, who has been supervisor of residential sales for the Calumet area of the Northern Ind. Pub. Serv. Co., has been promoted to merchandise sales supervisor of the general sales office in Hammond. He formerly lived in Gary.

E. H. Sykes, division sales supervisor at Goshen, has been named sales supervisor of the Hammond division of the company. Waldo W. Schram, supervisor of industrial and commercial sales in Hammond, has been appointed division sales supervisor at Goshen.

Theodore Dienst has been made manager of the Power and Gas Co. at Winchester, Ind. Mr. Dienst was formerly connected with the Ohio Electric Power Co., at Sidney, O.

Harry M. Green has been appointed Manager of *Mechanical Goods Sales*, Pacific Coast Division which is comprised of the Los Angeles, San Francisco, Portland, Seattle and Salt Lake City branches, was announced today by H. A. Everlien, Sales Manager, Mechanical Goods Division, United States Rubber Products, Inc.

In his new position Mr. Green will coordinate his activities with those of J. B. Brady, General Manager of the Pacific Coast Division, with headquarters in San Francisco. In addition, he will continue as Manager of Mechanical Goods Sales in the San Francisco Branch.

Robert G. Hunt, vice-president of Byllesby Engineering and Management Corporation and Standard Gas and Electric Company, after thirty-nine years of service with the Byllesby organization and predecessor companies, resigned on December 1 to retire to private life. Mr. Hunt plans to reside at Griffin, Georgia, forty miles south of Atlanta.

In 1905 he was appointed manager of San Diego Consolidated Gas and Electric Company—that company's first manager following its acquisition by H. M. Byllesby and Company. In 1906 he was transferred to Chicago and appointed assistant to Arthur S. Huey, vice-president in charge of operation, H. M. Byllesby and Company. In 1923 he was elected vice-president of the company in charge of property acquisitions.

Protect Your
Industrial Installations.
The
"LOW WATER GAS
CUT-OFF"

¾"
1"
1¼"
1½"
2"
2½"
3"
3½"
4"

P. M. LATTNER MFG. COMPANY
CEDAR RAPIDS, IOWA

Welding Conference

The first annual welding conference on electric and acetylene welding will be held at Texas Technological College, Lubbock, Texas, Feb. 14 and 15, 1935.

All manufacturers and jobbers of welding equipment are invited to display and demonstrate their equipment. All persons interested in welding are invited to attend. There will be lectures, motion pictures, and demonstrations on various phases of welding. No charge will be made for the conference. Bring your welding glasses. Ample hotel accommodations can be obtained at reasonable rates.

All inquiries should be ddressed to Professor H. F. Godeke, Professor of Mechanical Engineering, Texas Tech., Lubbock, Texas.

E. W. Bixby Now With Pittsburgh Equitable

The Pittsburgh Equitable Meter Company, Pittsburgh, Pa., announce that Mr. E. W. Bixby has joined their organization in a sales capacity. Mr. Bixby, who will be attached to the recently opened Memphis office of this company at 67 McCall Street, is very well known to the trade throughout the South. He was formerly Sales Manager for the Columbian Iron Works at Chattanooga, Tenn.

E. N. Bixby

Mr. Bixby will contact the trade in Chattanooga and other towns in Tennessee as well as in Kentucky. He will represent both the Pittsburgh Equitable Meter Company and its subsidiary organization, the Merco Nordstrom Valve Company.

Max D. Rose Vice President American Radiator Co.

Max D. Rose, Eastern Sales Manager of the American Radiator Company, was recently elected vice-president of that company. Mr. Rose, who was appointed Eastern Sales Manager a year ago, entered the employ of the company in 1906 immediately after his graduation from the University of Chicago.

He was born in Decatur, Michigan. After four years of work for the company as a salesman in Chicago and Wisconsin, he became assistant to the manager of the Chicago branch in 1910. Three years later he was made manager of the Denver branch of the company which position he held until 1918 when he was appointed Assistant General Manager of Sales.

N. M. Blanchard, Western Sales Manager L. J. Mueller Furnace Co.

N. M. Blanchard has been appointed Western Sales Manager, involving the Northern tier of states from Minneapolis to Salt Lake City. His headquarters will be at the branch office in Omaha.

Mr. Blanchard has been connected with L. J. Mueller Company for eleven years, 1924-1932 as territorial salesman, 1932-1934 as Omaha branch manager, and now Western Sales Manager.

100 Pounds or More Cut to Medium or Low Pressure

Fulton Toggled Reducing Regulator

GAS pressures of 50 to 100 pounds or more in tanks or transmission lines are reduced to medium or low pressure in the distribution system by the Fulton Toggled Reducing Regulator. It can be equipped to operate with either natural or manufactured gas, maintaining the desired delivery pressure. For reversing furnaces, constructed with oversize valves. Also adapted for control of By-Product Coke Oven Gas. Ask for Circular, No. 2573.

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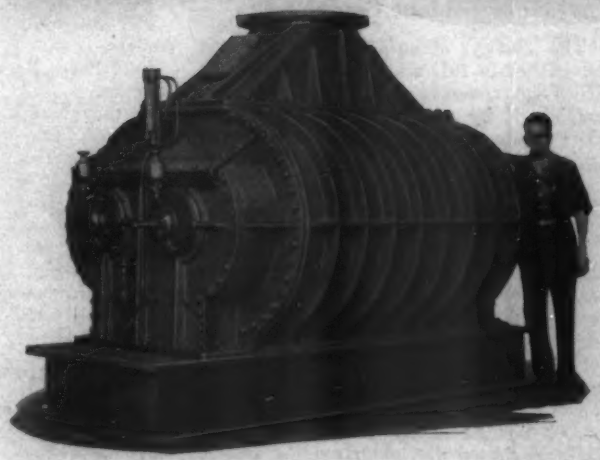

INDUSTRIAL PLANTS PREFER CONNERSVILLE METERS

THIS 26 x 72 Connersville Meter, passing more than 1,500,000 cu. ft. of 30-60 gas per hour, at pressure of 20 lbs., installed in a leading Chicago packing house, is the largest single positive displacement meter ever supplied for industrial service.

Connersville Meters are acceptable to both gas producers and consumers because their dependable accuracy is machined in, and is maintained by cast iron and steel construction throughout.

A wide range of sizes and types is available. Capacities range from 1000 to 2,000,000 cu. ft. per hour, for maximum peak line pressures up to 25 lbs. High-pressure types range up to 75 lbs. Special arrangements can be provided for pressures up to 300 lbs. and higher. Instruments, for recording or integrating, to suit almost any requirement.

Write for Bulletin 40-B10

Roots CONNERSVILLE

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12th & Columbia — CONNERSVILLE, IND.

New York—Chicago—Pottstown, Pa.
Boston — Pittsburgh — Detroit — St. Louis — San Francisco — Los Angeles

TRADE NEWS

The Stacey Manufacturing Company Again Operated as an Independent Company

The Stacey Manufacturing Co. was established in 1851 and operated as an independent company until in 1931 it was purchased by the International-Stacey Corporation, which, until recently, owned and controlled all of the outstanding stock. From early 1932 to December, 1934, the Company was under the control of a Trustee. During that period all property, including plant machinery, field erection equipment, patterns, drawings and engineering records remained intact and the plant, as a whole, was properly maintained and kept in first class operating condition.

In December, 1934, the organization which so successfully operated The Stacey Manufacturing Company prior to 1931, purchased outright from the International-Stacey Corporation and its subsidiaries, all the assets and common stock of The Stacey Manufacturing Company and now own the Company in its entirety.

The personnel, which is again in complete control of the management, is prepared to render the same efficient service that for more than 80 years has characterized the Company's position in the gas industry.

At a recent meeting of the present stockholders, Alvin A. Ranshaw was elected President and General Manager, Wm. W. Birch, Vice President, Edw. J. Baechle, Secretary and Treasurer, Geo. H. Cressler, Vice President in Charge of Sales and Frank O. Pandorf, Vice President in Charge of Engineering. These officers also constitute the Board of Directors.

American Meter Company Announces New Bulletins

American Meter Company, Lincoln Bldg., New York, has announced release of a new catalog and instruction bulletin on the Metric Indicating Flowmeter.

This bulletin is attractively printed and fully illustrated with diagrams for various types of installations. It is published in the new 8½ x 11" size for adaptation to the company's loose-leaf binder which has been recently introduced. The number is E-3.

To date the following additional new bulletins have been printed in this size:

AG-11 Meter Proving and Testing Apparatus; Cubic Foot Standards.

AG-13 Wet and Dry Test Meters; Demonstration Meters.

AG-14 Demand Meters—Recording, Indicating.

AG-6 Service Cleaners.

E-15 Metric Wide Range Orifice; Needle Valves and Fittings.

E-21 Recording Gravitometer.

The following bulletins will be released in January in the new size:

EG-40 Ironcase Meters.

E-5 Rate-Volume & Liquid Level Controllers.

E-12 Base Pressure & Base Volume Indexes.

In the process of revision and standardization, this company will have all its literature in the new 8½ x 11" size with the exception of Handbook E-4 on Displacement Measurement and Handbook E-2 on Orifice Measurement. The latter publications are purely educational being adapted mainly for reference work and study in engineering offices and libraries.

New Chaplin-Fulton Catalog

A somewhat enlarged but still very compact and manageable 1935 catalog of the Chaplin-Fulton Manufacturing Company, Pittsburgh, Pa., just issued, is dedicated to those responsible "for the safe and economical distribution and regulation of natural and manufactured gas in private dwellings, mills, factories, and street mains, and for the controlling of the steam pressure and gas fuel supply to steam boilers." The catalog is well printed, illustrated, and provided with charts and tables. The types of regulators described and shown cover all the more common forms of service for both natural and manufactured gas, and the availability of special regulators for many special purposes in the use of steam, water, oil and air is made plain. The increased size of its present catalog, as compared with earlier ones, is explained as due to the addition of certain toggled high-pressure regulators, relief valves, motor valves, and differential pressure regulators for mixing gases or gas and air, which were not included in former editions. Existing types are always subject to modification; and new types are added from time to time as new demands arise.

The Western Gas Construction Company Consolidated with the Koppers Construction Company

The business of The Western Gas Construction Company, of Fort Wayne, Indiana, has been consolidated with that of its parent company, The Koppers Construction Company, of Pittsburgh, Pennsylvania, and the activities formerly carried on in the name of The Western Gas Construction Company will hereafter be carried on under the name of The Western Gas Construction division of The Koppers Construction Company.

The consolidation, effective as of January 1, 1935, does not involve any change in physical operations or activities which will continue to be centered in Fort Wayne, Indiana.

Minneapolis-Honeywell Names H. W. Sweatt President

H. W. Sweatt, for the last eight years vice-president and general manager of Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., has been made president of the company, according to an announcement made public by the board of directors. He succeeds M. C. Honeywell, who has served as president since the merger of the Minneapolis Heat Regulator Co. and the Honeywell Heating Specialties Co. in 1927. Mr. Honeywell becomes Chairman of the Executive Committee.

Mr. Sweatt has been identified with Minneapolis-Honeywell for more than 20 years, acting in various positions throughout the plant and as general manager, in which capacity he will continue.

In addition to Mr. Sweatt and Mr. Honeywell, other officers of the Minneapolis-Honeywell Regulator Co. are: W. R. Sweatt, Chairman of the Board; C. B. Sweatt, vice-president in charge of sales; W. L. Huff, vice-president and treasurer, and C. C. Buckland, secretary.

U. S. Pipe and Foundry Co. Make Personnel Changes

The United States Pipe and Foundry Co., Burlington, N. J., has appointed Ralph M. Shaw, Jr., publicity manager for the company, with headquarters at Burlington, N. J., succeeding S. E. Linderman.

Mr. Linderman has been appointed Washington Representative, in charge of the company's Washington Office, and will devote his entire time to that position.

New Service Chart for Nordstrom Valves

The Merco Nordstrom Valve Company, a subsidiary of Pittsburgh Equitable Meter Company, has recently issued a Service Chart describing under the headings, "Operation," "Adjustment," "Lubrication" and "Repair," the proper care for Nordstrom Lubricated Plug Valves.

The Service Chart is printed on heavy stock, suitable for tacking on the wall in operating headquarters or near Nordstrom Valve installations.

Copies of this chart may be obtained by addressing the main offices of the Merco Nordstrom Valve Company at Pittsburgh, Pa., or any of their branch offices throughout the country.

Merco-Nordstrom Issues New 32 Page Bulletin

Merco-Nordstrom Valve Company, subsidiary of the Pittsburgh Equitable Meter Company, Pittsburgh, Pa., has recently issued a 32 page bulletin describing "Merco" lubricants for Nordstrom Lubricated Plug Valves. This bulletin gives detailed information on the correct type of "Merco" lubricants to be used in over three hundred different services. Copies may be secured by writing the Merco-Nordstrom Valve Company, 400 N. Lexington Ave., Pittsburgh, Pa.

Byllesby Engineering

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Wholly-owned subsidiary of

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LAVINO GRANULAR OXIDE

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Yes, Lavino Granular Oxide is revolutionary in Gas Purifying Materials — nothing previously like it—and nothing which will give anywhere near as much Dry Box purification for the dollar expended.

EVERY GRANULE IS ENTIRELY AVAILABLE FOR H_2S REMOVAL. IT REQUIRES NO SHAVINGS OR OTHER CARRYING MEDIUMS (therefore mixing costs and troubles are eliminated)—plus other distinct advantages.

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The Reliable Shut-Off for Street Mains

Equipped with Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip. Gas cannot pass.

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ISBELL-PORTER COMPANY

Engineers and Contractors for Complete Gas Works

I-P C

Manufacturers of All Kinds of Gas Apparatus

NEWARK, NEW JERSEY

The Washington Plan

(Continued from page 13)

sumers' share" and for the purposes of this section 'the surplus profits' shall mean a sum of which the consumers' share is three-quarters:

(2) If and so far as the balance standing to the credit of the net revenue account after providing for dividend on the preference stock and dividends at the authorized rates on the ordinary stock in the opinion of the directors permits a sum not exceeding one quarter of the surplus profits shall be applied in two equal parts for the benefit of the holders of ordinary stock and for the benefit of the employee copartners of the Company in manner hereinafter mentioned:

(3) Any sum so to be applied for the benefit of the holders of ordinary stock may be applied in the increase of the dividends above the authorized rates and if and so far as not so applied shall be carried to the reserve fund:

(4) The sum so to be applied for the benefit of the employee copartners of the Company shall be carried to the copartnership fund. The moneys so carried to the copartnership fund shall be allocated by way of a uniform percentage of bonus on the salaries and wages of the employee copartners of the Company. The trustees of the copartnership fund shall be the persons who are for the time being the employee directors of the Company elected under the provisions of the South Metropolitan Gas Acts of 1896 and 1897 together with persons who are for the time being the chairman and secretary of the Company:

(5) Any balance of the profits of the Company not applied as aforesaid shall be carried to the credit of the net revenue account of the Company for the next following year or half-year. Provided that the sum standing to the credit of such net revenue account shall not at any time exceed the amount required to pay one year's dividend on the preference stock and one year's dividends at the authorized rates on the ordinary stock of the Company."

Since 1920 many other companies have secured similar revisions in their sliding scale regulations.

There have been few applications of the sliding scale principle to gas companies in this country. The Boston Consolidated Gas Company is without question the outstanding instance. Ann Arbor, Michigan, also adopted a sliding scale form of rate regulation in 1918.

In 1905, shortly after the amalgamation of various companies to form the Boston Consolidated Gas Company, the State Legislature authorized the Governor to appoint a Committee consisting of the Board of Gas & Electric Light Commissions and two other persons to investigate the advisability of applying the sliding scale principle to the above mentioned company. The members of the Committee failed to agree. The Gas & Electric Light Commissioners, forming a majority, presented a report adverse to the plan. The other two members, in a minority report, advocated its adoption. The Legislature accepted the views of the minority, and the Boston Sliding Scale Act was passed in 1906.

The Act was patterned after the old-type English acts, and provided for a standard price, a standard rate of dividend, a ratio of price and dividend changes, restrictions on the method of financing, provisions for change in the standard price after ten years to adjust for conditions beyond the control of the company, etc. As in the English acts of that period, the standard price was the maximum price charged. With a block rate, it would have been the first block. The establishment of promotional rates was thus almost out of the question. All in all, however, the plan seems to have been quite successful in Boston up to the time of the war, when its lack of adaptability to rapidly changing prices became apparent. Various changes in the standard price were made under the provisions mentioned above. Finally, in 1926, the sliding scale was abandoned by common consent, because of its obvious defects and its unwarranted restrictions on rate forms, and because the interpretation of many parts of the Act was in doubt. The company evidently considered it better to abandon the whole plan rather than attempt to modernize it.

The "Washington Plan" attempts to accomplish the same things as the Boston Sliding Scale was intended to, but seeks to avoid most of the defects of the latter.

The success of the "Washington Plan" in bringing about rate reductions without injury to the company gives it strong appeal. Its record thus far has been almost phenomenal. But local conditions, at least partly beyond the control of the company, have undoubtedly been an important factor. It is not a new development, but a modernization of a plan that has been tried and used by gas companies in Great Britain for eighty years.

Operating Division of N.E.G.A. Holds Annual Meeting

(Continued from page 48)

Although the overburden was 14 feet above the duct top no difficulties were encountered in preventing depression of the fill after the front end of the duct was leveled to the slope of repose of the fill material. It was thought the leveling might cause the duct to deflect during jacking but the total deflection from planned alignment was unnoticeable.

The operation was carried on 24 hours a day during jacking, as stopping would have added to the friction and limited the jacking distance.

Mr. E. H. Eacker, Engineer, Boston Consolidated Gas Company, presented "Development in Transportation Equipment." Particular interest was manifested in a description of a power take off for compressors developed by the Boston Company costing less than half of the usual amount. When turning in a truck the take off could be easily removed and the small space cut out of the standard platform easily filled in.

"The Value of Meter Records to Our Company" was presented by C. H. Thacher, Distribution Supt. of the New Haven Gas Light Co. The records were valuable in indicating types and ages of meters which could not hold proof after repairs thus indicating those which economy would justify condemning. The records also indicated the effect of a change in the diaphragms used in the repair shops. The primary function of the records was to set up repair and condemning policies.

A brief "Discussion of Mr. Thacher's Paper" by Mr. A. McW. Wolfe, Assistant Manager, Tufts Meter Works, followed the presentation. Mr. Wolfe emphasized the need for consistent records and the value of accurate metering particularly with the increase in use of low consumption equipment and accessories.

The newly elected officers are: Chairman, Mr. A. C. Frey of Worcester; Vice Chairman, Mr. J. A. Weiser of Newport; Secretary and Treasurer, Mr. D. S. Reynolds of Boston; Directors, Mr. D. R. Campbell of Portland, Mr. R. S. Carter of Malden, Mr. P. M. Hatch of Stamford, Mr. G. G. Howie of Cambridge, Mr. C. J. Leuders of Lynn, Mr. R. H. Patterson of Lawrence.

This Johnson Bench Furnace *is a fast worker!*

The No. 101 Bench Furnace provides quick, intense heat for heating soldering coppers up to 12 lbs. per pair. The full benefit of the gas flame is utilized by correct design and construction of the fire-box. Two powerful Johnson Bunsen Burners furnish abundant heat without forced air blast. The cost is low. Write for details.

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FOR
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LARGEST GAS COMPANIES NOW
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SEND FOR OUR CIRCULAR ON METER REPAIR PARTS

SAMPLES AND PRICES
GLADLY SENT

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IRON HYDROXIDE

Play safe this winter.
Fill your boxes with
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Foot of Halsey St
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HEATING BUNKER "C" OIL

for carburetting gas requires high pressure and high temperature.

ANDALE BOWED TUBE HEATERS

remain tight and are easily cleaned. These are the requirements for continuous satisfactory operation.

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ALL STEEL TOOL AND SUPPLY TRAILERS FOR GAS AND ELECTRIC COMPANIES

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Every issue has some helpful information on all phases of the gas industry.

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1. **An Increased Range of Capacities**
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